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3D world

THE INTERNATIONAL MAGAZINE FOR 3D ARTISTS

MONSTERS, INC.

'If you do it right, it looks effortless.' So is Pixar's latest scarily good? p28

SHINE ON

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SUBSCRIPTIONS page 92

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editor's perspective

"All the most beautiful computer graphics trickery in the world can't make up for a weak story," says Pixar's Lee Unkrich in our cover feature on *Monsters, Inc.* Well duh, you might think. But then try telling that to the major studios who, between the script stage and the screening, usually manage to lose this kindergarten fact in a welter of gee-whiz pyrotechnics.

Look at this year's so-called blockbusters, most of which got a critical drubbing and/or flopped horribly: *Tomb Raider. Planet of the Apes. Swordfish. Pearl Harbor.* And of course *Final Fantasy* (as many of you agreed in your responses to last issue's news story on its commercial failure). All relied heavily on "computer graphics trickery" and all had useless stories.

Let's hope, then, that said studios have learnt their lesson and finally realise that even the least discerning film-goer no longer accepts a bunch of artfully-rendered pixels as entertainment for two hours. Hang on – crediting movie executives with intelligence? Now there's a story and a half...

Ed Ricketts
Editor

The critical list

MARK BRIERLEY is a freelance *Softimage* animator based in Bristol in England, with numerous CG-related projects under his belt.
MAT BROOMFIELD has been a journalist for over 10 years. He's a PC specialist with a penchant for creative computing.
GEORGE CAIRNS teaches students the joys of *Maya* by day; by night his alter-ego produces science-fiction artwork for CCGs.
SIMON DANAHER is a Mac fiend who corners the market in 3D-related reviews and tutorials.
PETE DRAPER, a *3ds max* expert, is Orchard Creative Design Group's senior 3D artist and a regular *3D World* contributor.
MARTIN GISBORNE is half of CarbonBlack, a company dedicated to software evangelism. He's also a graphic artist and designer with many years' experience in the graphic arts industry.
STEVE JARRATT Long-standing Future editor and *3D World* contributor, Steve loves his Mac and *LightWave,* as well as Bassett hounds.
SET LONNERT produces articles, books, educational materials and lectures in the ancient Swedish university town of Uppsala. He's a Java expert and likes clean code.
MARK RAMSHAW is a long-standing contributor to many games and design magazines and is a *3D World* mainstay with plenty of features under his belt.
BENJAMIN SMITH is 3D director at Stormfront Digital Pictures, an award-winning studio which specialises in producing animation and visual effects for TV and visitor attractions.

contents

revelation

inspiration

application

ISSUE
20

perspective

regulars

reviews

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Courtesy of Pixar

NEXT
ISSUE
20 • 12

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EXHIBITION

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FISCHERHÜTTE
Rhinoceros, Bryce 4 and Photoshop 5
niceguy_2000@gmx.de

01

EXHIBIT YOUR CREATIONS

Supply your images rendered at print resolution (ideally 3000 pixels wide or high) on CD or Zip disk to the address below. Please note: images resized in *Photoshop* are not of sufficient quality and will not be used. Files under 1.5MB in size can be e-mailed to 3dw.exhibition@futurenet.co.uk. Alternatively, send your print-resolution images on CD or Zip disk to Exhibition, 3D World, 30 Monmouth Street, Bath, BA1 2BW, England. Images that are rendered at 500 pixels or smaller will NOT be printed in the magazine.

BE AN EXHIBITIONIST

If you are an up-and-coming artist in 3D and you don't yet have a job with a major studio, we want to speak to you. We want your showreel to go on our CD, a cool collection of pictures – and a promise we'll hear from you when you get a job! See the address to the left.

01

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02

» exhibition


01

02

» exhibition


05

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03

04

06

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01

02

» EXHIBITION

03

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[02-03] **DAMJAN CVETANOVSKI**
SUMMER VIEW OF THE ATRIUM AND SUNDAY AFTERNOON IN BOLOGNA
3DS Max, Lightscape, Poser, Corel Photo-Paint, AutoCAD
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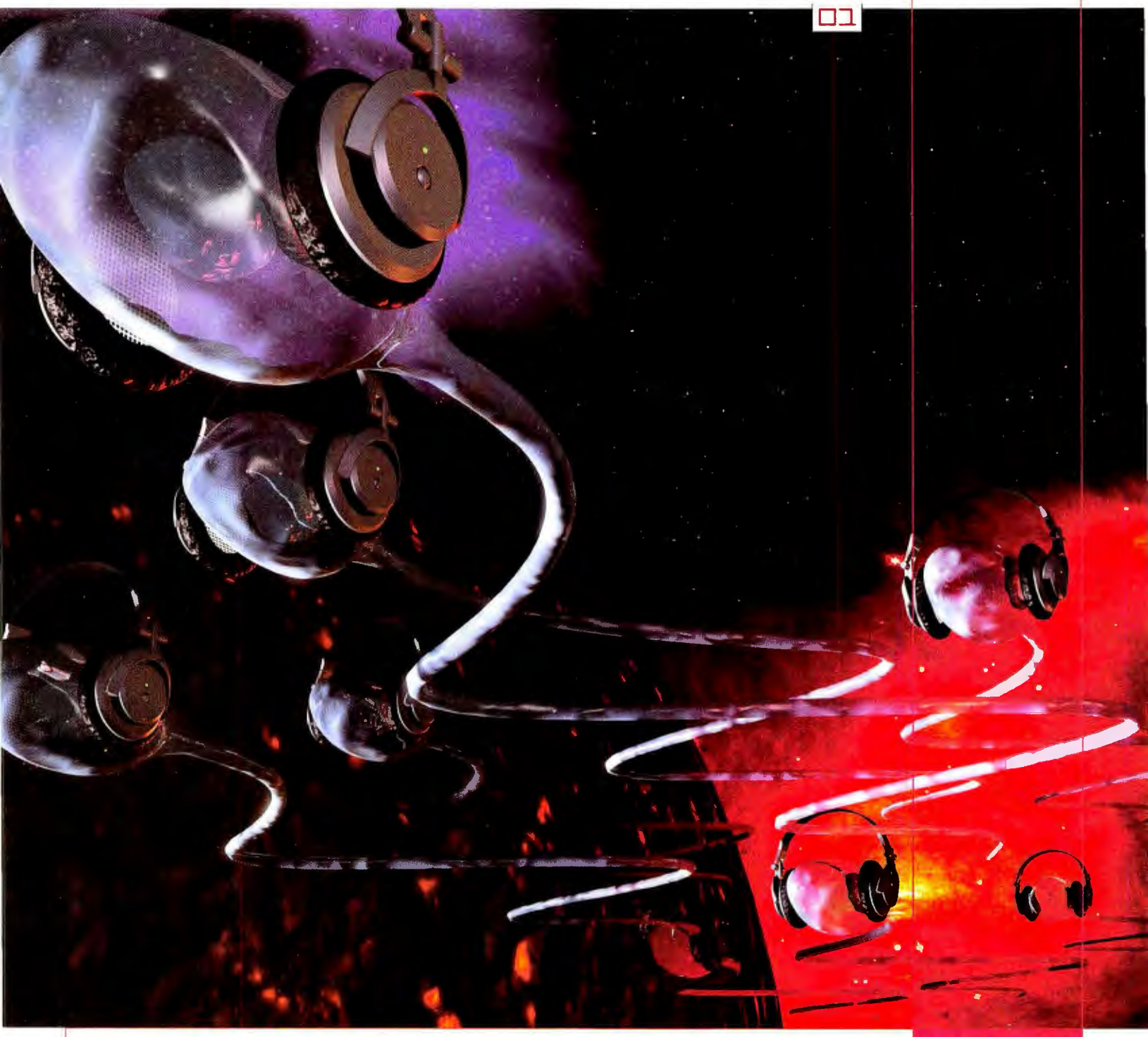

01

(01) JOHN SIMPSON
FLEET
3ds max and Photoshop
jsimpson@enternet.com.au

» EXHIBITIONIST »

All alone in a cruel sea....
but surrounded by Cloth

CLOTH 3DS MAX plug-in allows you to create highly realistic animation of clothes on characters and fabric on objects. Simple to use with fast reliable calculation, **CLOTH** delivers production quality dynamic cloth simulation.

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Visit our web site to request a demo of **CLOTH** or download the fantastic **'A Brief Good Knight'** movie.

'Knight on Ship' image from the movie 'A Brief Good Knight' by Ed Taylor and Damien Johnson (also animators of Tiny Planets). Tunic, sail, flag and sea all animated with CLOTH.

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KELSEUS

eXHIBITIONIST

This issue's debutant, from Sweden, is the award-winning face of the 3D Festival

If Peter Aversten's face seems familiar, don't worry – it doesn't mean you've been having nightmares again about S&M robots with waxed moustaches. It will be because Peter was a photographic model for the cyborg freak used to eyecatching effect on the 3D Festival's ads and promotional literature _ and his Self Portrait as a Merchant (right) won the award for Student 3D Still at the Festival.

He picked up this job while working as an intern at Tensiongraphics in Malmö, a port and fortified city in southwest Sweden. Peter created five images using *Maya* and *Photoshop* as part of the Festival's Expressions series of 3D humanoids. He's in a two-year animation and 3D course at Graphic Studio in Stockholm, currently learning the ins and outs of *Maya, XSI* and *Flame*.

Peter was introduced to 3D back in 1995 when, feeling experimental, he bought a copy of *Strata Studio Pro*. He soon began using it for his work as a retouch artist at a Swedish pre-press company, a job he recently traded for the creativity of his course. "The most useful element of the course is that it buys me time to explore, and I don't have a client over my shoulder," he says. "After seven years as a retouch artist it's nice to have time for myself, and it feels great to take a step in another direction." There are plenty of other strings to Peter's bow, including painting, editing a column about 3D matters in *Meshmen* magazine and exhibiting sculptures in metal.

But he is relatively new to modelling characters. "It's fun, but tough – the Expressions for the 3D Festival were developed mainly in my head, or as impulses when I started messing around with things in *Maya*." Working from face-on and profile photos as a reference for the character's main neutral pose, Peter matched the perspective in each pose and fleshed it out using the Connect polyshape plug-in, which was downloaded from the very useful www.highend3d.com.

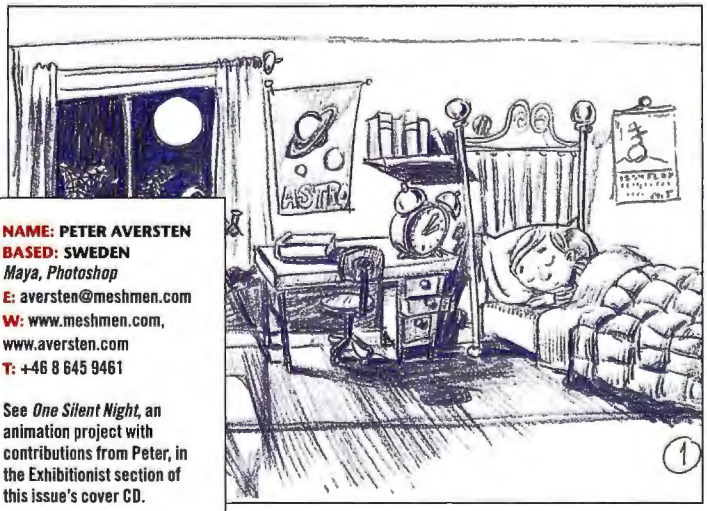
Next, the scenes were rendered for compositing in *Photoshop*, where matching geometry became a time-consuming task. "I had to swap back and forth from *Maya* to *Photoshop*, rendering low-res versions. Because I made them for 50x70cm print resolution, rendering times were a big thing. One of the images took 13 hours to render; I wanted a merged look of 3D and photo combined." The textures in the finished image were fashioned mostly with shaders ranging from chrome to plastic, and for the reflections in the chrome he took one of his previous pieces, blurred it slightly and used it as an environment sphere.

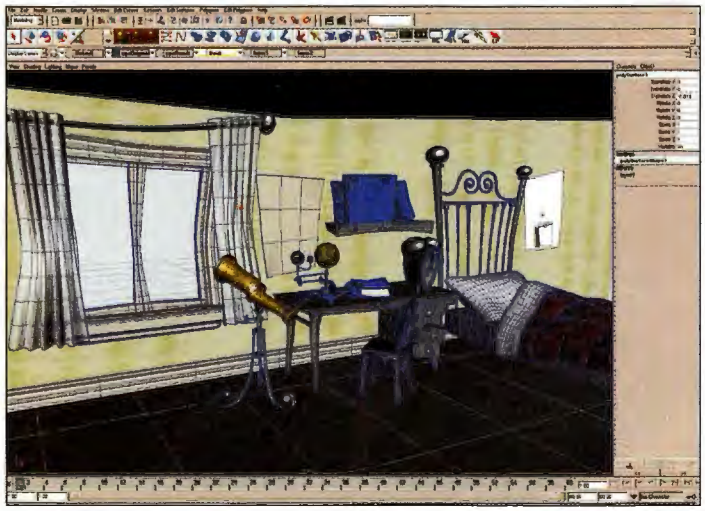
Peter also keeps his eye on developments in animation. "I'm mainly searching for a job in the moving-image industry, maybe at an effects company, a post-production or 3D outfit. It would be fun to end up working with animation. I remember when I first wanted to be an animator. I was about seven years old and met an old fellow who told me he had been working at Disney – I still love old Disney movies, and I still love animation."

His next project, which he's largely keeping

under wraps at the moment, is a dream-like animation, provisionally entitled 13 and narrated by an actor friend. "The project is an old dream that I'd like to see through," Peter says. "It involves nuclear silos and cotton fear [the fear of nuclear mushroom clouds] as well as dirt, plastic, chrome, rust, gas masks and biosuits." Disney would be so proud...

Finally, when asked about general future developments, Peter has already made up his mind. "I think the future will be faster, cooler and more user-friendly."





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See *One Silent Night*, an animation project with contributions from Peter, in the Exhibitionist section of this issue's cover CD.

3D world

3dw news

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3D Festival

Europe's answer to Siggraph is establishing its own identity and looking to build a creative community away from the hard sell of trade shows

If the number of big-name companies that turn up at festivals is an ever-reliable indicator of the financial health of an industry, a closer look at the actual punters who attend offers a much richer insight into what makes it tick.

After its second year in Copenhagen, October's four-day 3D Festival and Europe's premier event on the 3D calendar, enjoyed unprecedented success in almost every respect. It was bigger for a start, with a fifth more floor space to mooch around in. The demographics of the audience were also distinctly more varied than before. Not only did more visitors attend from the host country, but people travelled to the festival from almost every European country and in greater numbers. Hundreds of visitors from Britain, Germany and Spain, as well as a fair representation from the US, helped swell the ranks to a claimed 8,000 to 10,000 attendees, between 2,000 and 4,000 up on last year.

Similarly, the number of speakers was nearly twice that of last year, with 60 people giving lectures, teaching classes and seminars. Consequently, an extra day and extended premises were allocated to the festival to fit them all in, and the number of hands-on workshops and seminar sessions almost doubled as a direct result.

When it comes to earth-shattering new software and hardware releases, the 3D Festival is always going to be eclipsed by the sheer magnitude and momentum of the Siggraph Conference, which has become the industry's prime focus. Realising this, the European event compensates by emphasising the educational and community aspects on offer – hence the expanding seminar and speaker programme. But since everyone is batting for the same team on both sides of the Atlantic, does comparison between the two festivals reveal any significant climate changes?

The results are noticeable and very welcome. This year's show was a far cry from the corporate hustle and hard sell of Siggraph, providing a relaxed, certainly more European atmosphere to meet, greet and network with professionals from all areas of the industry. The single, easily navigable location and the pleasant (if unexciting) environs of Copenhagen, coupled with a rip-roaring awards ceremony and party all added to the general atmosphere of conviviality.

Copies of *3D World* were being snapped up – and were sold out by Friday lunchtime. In short, all seemed to agree 3D Festival 2001 was a resounding success.

CONTACT: www.3dfestival.com

Eager beavers at the 3D Festival are treated to desirable giveaways (left and above)

DIGITAL HEROES

Congratulations to the winners of the 3D Festival's 12 Digital Hero awards:

STUDENT 3D ANIMATION
Reveils by Duchet, Maginez and Wibaut
Supinfocom, France

STUDENT 3D STILL
Self-portrait as a Merchant by Peter Aversten
Graphic Studio, Sweden

INDUSTRIAL DESIGN
Maja by Patrik Palovvara and Tommy Forsgren
Sweden

MUSIC VIDEOS
19–2000 by Passion Pictures
UK

CHARACTER DESIGN
Asylum Characters by Robin Konieczny
Asylum, UK

LOGOS AND IDENTS
IBC 2001 Idents for VIZRT by Edvin Torgersen
VIZRT, Norway

THE DIGITAL HALL OF FAME
The One I Know
Christian Haley

GAME INTRO
Gunman Chronicles by Adrian Banninga
Streamline Studios, Netherlands

ARCHITECTURAL VISUALISATIONS
Light Study by Christian Jackson
UK

3D IN COMMERCIAL
Mini-Martians by Phil Dale
Passion Pictures, UK

3D ANIMATED SHORT
Deadline by Aardman
UK

COMMUNITY CONTRIBUTION
Shelley Page
Dreamworks, Europe

Cleaner light

FrameStore's new technique for high dynamic range presents Dyson in a new light – sucking itself into shape

Who cares if a Dyson does nothing but suck up the dust in your house? We want to see a complex 3D version of it magically assemble itself, rotate like a miniature space station and appear in as near to natural light as possible before we'll even consider replacing our clapped-out Hoovers or Kirbys or Electroluxes.

Lucky then that FrameStore was on hand to provide exactly these elements to advertise the new Dyson Root 8 Vortex vacuum cleaner, and could incorporate its new software for image-based lighting (IBL) into the bargain.

Having merged together eight photos of a chrome ball, each taken at varying exposures to capture the complete dynamic range from dark shadow to burnt-out light, FrameStore processed this HDR image into a form that could be used to light a computer-graphic model of the Dyson with its proprietary IBL software.

For the sequence where the dustsucker's parts assemble themselves, FrameStore's

animators had used *Maya* to draw 50 parts of the Root 8 in minutest detail to maintain a live-action feel. They then put the sequence together like a jigsaw puzzle in *inferno*, using X-ray passes and wipes to show the transformation taking place.

CONTACT: www.framestore.co.uk

AGE GRACEFULLY WITH DOSCH

Dosch Design, a German company, has released the latest addition of its compendious resources for the 3D artist, in the form of the Texture Ageing Kit. More than 300 ageing texture layers can be added and mixed with existing textures to produce such chaotic effects as wind and rain damage, rust and corrosion for metal surfaces, peeling and cracked paint, moisture stains and moss for stone surfaces. The multi-layer textures include all the relevant shader maps for the material properties such as colour, bump and specularity maps. Each comes in tileable format of at least 1024x1024 up to 2048x2048 pixels, and the whole collection costs $69. The Texture Ageing Kit is available online.

CONTACT: www.doschdesign.com

what's new

SOFTIMAGE 2.0 FOR LINUX

Following the recent port of *Maya* to Linux, Softimage has followed suit and released version 2.0 of *XSI* for that operating system, as well as Linux support for *Softimage 3D 4.0* and *Toonz 4.5*.

CONTACT: www.softimage.com

FREEFORM AWARD

FreeForm, SensAble Technologies' 3D modelling system, has been awarded the prestigious Good Design Award G-Mark symbol by the Japanese Industrial Design Promotion Organisation. The award was established in 1957 to promote outstanding design to the public. Previous winners include Sony, IBM, Honda Motor, Nike and Mitsubishi.

CONTACT: www.sensable.com

DEEP PAINT FOR LW

Right Hemisphere has released a *LightWave*-specific version of its acclaimed texture-painting software, *Deep Paint 3D*. Users can texture and paint over 3D objects, including UV-mapped surfaces. Offering two-way integration with *Photoshop* and tailored support for Wacom, the Windows version of the software costs $595. It is available online.

CONTACT: www.righthemisphere.com

WILDCAT OPTIMISED FOR ATHLON

3Dlabs has announced that its Wildcat II 5000 graphics card has been optimised for the new AMD Athlon XP 1800+ processor, offering what 3Dlabs claims to be the cheapest way yet to build high-powered workstation-class systems.

CONTACT: www.3dlabs.com

SWEDISH ANIMATRONIC ACTION

Having fondled IBM's futuristic SpaceBall 4000 back in issue 15, it's now the turn of Axiglaze, a Swedish outfit, to introduce its very own eponymous input device, developed specifically for the computer-graphics market.

With the Axiglaze you can craft animations in a way that feels like using classic animatronics. The device achieves this feel through six degrees of freedom, a large working space and a high degree of precision and velocity control.

The techniques were originally developed at the University of Zurich. Axiglaze took the research results and encapsulated them in an ergonomic device intended for use with high-end 3D, CAD and entertainment through a range of integrated plug-ins.

Specific uses, according to Axiglaze, include highly streamlined character posing and animation, motion-capture translation and an aid to facial animation and lip-synch

It's certainly a looker anyway. Keep your eyes peeled for a *3D World* review of this gadget in the near future.

CONTACT: www.axiglaze.com

A winner at Wembley

The Moving Picture Company uses *Boujou* to save a shot in football spoof

BELOW Mike Bassett, before and after the introduction of Moving Picture Company's *Boujou*-assisted rent-a-crowd.

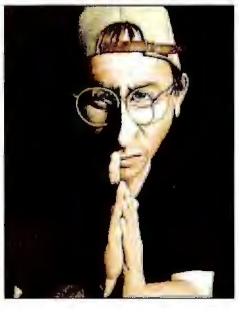
The Moving Picture Company's effects work for the recent football satire, *Mike Bassett: England Manager*, called upon 2d3's *Boujou* motion-tracking software to solve an unusual compositing challenge. The scene in question, one of more than 100 effects produced by the company, was shot in a deserted Wembley stadium and features the main character in close-up, being tracked by a handheld camera. As the camera spins, the structure of the stadium disappears behind the actor's head. The initial intention was to insert a crowd into the vacant rows of seating by tracking the corners in 2D.

"The obvious way to do the shot was to track the background and matte out the foreground character in order to be able to put all the different elements in," explains compositing artist Angela Barson from the Moving Picture Company, in Soho, London. "What made it extremely difficult was that the director wanted a documentary feel, so it was shot using a hand-held camera and an unrestricted zoom lens. This resulted in a very wobbly shot with unknown lens distortion. Any slippage of tracks was going to be really obvious, and with the main character taking up about a third of the screen for the entire shot, any of the tracks that you would normally pick up on were disappearing."

However, *Boujou*'s predictive tracking let MPC come up with the goods after all. It could provide a full 3D model of the shot and accurately predict where tracked features would be, even when they were out of the frame or hidden behind the actor. This made it possible for the crowd footage to be pinned to the corners of the seating banks throughout the entire shot.

To help MPC complete the movie, 2d3 added the facility to export the 2D feature tracks to compositing systems such as *inferno*, *Shake* and *Cineon*, and this track-export facility is now standard in *Boujou*.

CONTACT: www.moving-picture.com



Maya Masters

Alias|Wavefront presents a much-coveted new accolade

Cue dramatic music and gruff, cinema-trailer voiceover: "Among the many talented people in the world of 3D computer graphics we find masters whose work reshapes and redefines the boundaries of technology, art and visualisation. Mastery for these individuals is but a step along the way because their spirit and imagination drives them to find new ways of doing things. They see the world through a different lens. They are inspired and inspiring. They are mentors."

So begins the understated intro on the *Maya* Masters Web site, explaining the inaugural award for outstanding digital heroism in the 3D battleground of *Maya*n conflict. Dirk Bialluch, Chris Landreth, Nobuo Takahashi and Habib Zargarpou are the four talented artists to have joined the serried ranks so far. Visit the site below to look at their output or to nominate someone else for the award.

CONTACT: www.mayamasters.com

LIGHTWORKS FOR OS X

Lightwork Design has shipped *Lightworks*, its highly rated and widely used renderer, to Apple's new Unix-derived operating system, Mac OS X. Lightwork claims that its product is the industry's fastest rendering engine, and that it expects the software to further benefit from OS X's power, stability and graphics capabilities. *Lightworks for Mac OS X* varies in price depending on the number of seats the customer requires, and is currently available.

CONTACT: www.lightworkdesign.com

PICTURE COUTESY OF: PTC

ZBRUSH TEXTUREMASTER

The pixel-driven *ZBrush* has been bolstered with the introduction of a new Zscript utility, TextureMaster. The utility allows the interactive application of textures using any of *ZBrush*'s painting tools to editable 3D objects. TextureMaster includes a comprehensive five-chapter tutorial on texturing, ranging from the basics to advanced concepts. Also included are tips on importing objects, creating morph targets, and working with UV coordinates. TextureMaster is free to users of *ZBrush 1.23b*.

CONTACT: www.pixologic.com

onedotzero 2.0

A touring version of the world's largest digital film festival travels the kingdom

For the last five years, the renowned onedotzero digital film festival has been held in London, treating audiences to a dizzying range of screened innovation. Short films, animation, music videos, computer-game intros, motion graphics and commercials from around the world are all part of the festival's agenda. Having been exported to America, Japan, Australia and around Europe, the event is now embarking on a national tour, visiting many of Britain's major cities.

In each venue, the show consists of one to four strands, which feature animated curios aplenty. The strands are Wavelength 01, featuring music videos and commercial directors' work, including banned, alternative and rarely shown versions from the likes of Designers Republic, Shynola and Tim Hope.

Intriguingly, the next section, Lens flare 01, features visuals

> SHORT FILMS, ANIMATED CURIOS, GAME INTROS, MOTION GRAPHICS AND COMMERCIALS WORLDWIDE

from computer gaming, including unreleased intro movies from Playstation2 developers and gaming cinematics from Capcom and Konami. J-star 01 introduces contemporary digital style from Japan, with anime, motion graphics and music videos, plus new work from Koji Morimoto, Gen Sekiguchi, Tycoon Graphics, and Hideyuki Tanaka.

Finally, Wow+flutter 01 delivers a selection of motion graphics and future visual styles from non-traditional film-makers, such as graphic designers and illustrators. A TV series, *onedottv*, is also currently airing on the UK's Channel 4.

CONTACT: www.onedotzero.com

EVENTS

28 NOVEMBER

LIGHTWAVE 3D EVENT

Join Newtek's Andy Bishop for a celebration of *LightWave* 3D at Uxbridge, Middlesex, in west London. You can pick up a Tips and Tricks DVD, see version 7 in action and maybe learn a thing or two... To register for the event, contact Jacqui Smith at Gomark.

CONTACT:
jsmith@gomark.com or
+44 (0)20 7610 8686

3 DECEMBER

3DECEMBER

Alias|Wavefront's 3December celebration of 3D creativity took place in 29 cities simultaneously last year – on the appropriate date – and the 2001 show promises to deliver more of the same. Exhibitors, industry speakers and live contests in 3D design are all expected. Register online.

CONTACT:
www.3december.com

5 – 7 DECEMBER

ASIA ANIMATION 2001

The event will feature the latest software and animation technologies, a spotlight on successful production houses such as PASI and a conference programme covering topics including art, photorealism and bringing fantasy to life. There will also be plenty of news on the continent's latest projects.

CONTACT:
www.asiaanimation.com.sg

7 – 9 FEBRUARY

VEAF 2002

The Vancouver Effects and Animation Festival is often held in conjunction with a trade expo showing off the latest hardware and software releases, but the festival itself is more of a celebration of creativity, with awards for animations in various 2D and 3D categories.

CONTACT: www.veaf.com

VIRTUALIGHT 1.1

Credit is due to Virtualight, whose eponymous standalone global illumination render engine has reached its seventh incarnation and has still only reached version 1.1.0a. Plaudits must also be given to the company for releasing it as shareware, with a one-year commercial use licence costing only $50. Perhaps you should shoot over to the site below and check out the new feature-list, which includes new functions, displacement and binary mapping and new camera lens models. What have you got to lose?
CONTACT: www.3dvirtualight.com

Creature Lab from FXRealm

Frankensteinian frolics with the latest from the Scandinavian laboratories

Following the success of *Creature Creator*, Sweden's FXRealm has spawned another monster in *Creature Lab*.

With the new program you can create any kind of character project from the body parts of various four-legged boned animals. Or build your own project parts, so inorganic objects such as spacecraft can also be tackled.

Creature Lab exports its creations to other software – *max*, *LightWave*, *trueSpace* and *Maya* are already on the list. In any case, the software also allows plug-ins for import and export so you can write your own loader utility.

A demo of *Creature Lab* is available online.
CONTACT: www.fxrsoft.com

EJAA WINNERS ANNOUNCED

The winners of the European Junior Animators Award 2001 were announced at Computer Arts Live 01. First prize went to Owen Simons, a recent graduate from Glamorgan Centre for Art and Design (Wales), now working for Blue Monkey Studios in Cardiff. He won a Softimage|XSI v.2.0 licence, a workstation from Hewlett-Packard, training in Softimage|XSI from the Surrey Institute of Art and Design, subscriptions to magazines from Future Publishing and a Softimage goody bag.

Second prize was awarded to Kevan Shorey, a third-year student at Bournemouth Uni who is about to embark on a master's course concentrating on 2D animation. The runner-up was John Hedley, who graduated last year from Teeside Uni and now works for Sweden's Unique Development Studios.

The competition, organised by Softimage, was judged by a panel of industry experts including Alistair Hearson of Glassworks, Adrian Wyer from The Hive Animation, and Hitesh Patel of TJFX (The Mill 3D).

"The submissions for the competition have proved to the 3D community that Europe is a centre of excellence for junior animators and that there is a large amount of upcoming talent out there," says Richard Craig McFeely, of Softimage Europe. "Owen's entry in particular showed an all-round appreciation and demonstration of character animation, direction and narrative – he has a great future ahead of him."

Entry details for next year's competition are available online.
CONTACT: www.softimage.com

Stills from the work of Owen Simons, winner of this year's European Junior Animator Award.

VR4Max

New real-time VR utility lets models be checked while mouse still in *max*

Check and distribute *3ds max 4* models with only mouse clicks while still working within the *max 4* environment. That's the promise of Tree C Technology, a company in the Netherlands and Belgium. Its *VR4Max* is described as an OpenGL real-time interactive virtual-reality environment.

All *3ds max* objects, cameras, lights, material definitions and animations can be exported to *VR4Max*, also meshes, particles, IK, *Character Studio* animations and advanced texture and environment maps. Peripherals such as Stereographics' Crystal Eyes and various input devices can be used to view and navigate within *VR4Max*.

Version 2, due in spring, promises a raft of new features and an event-driven mechanism for setting up interactivity. It also includes recording of camera movement, interactive object transformation for altering scale and rotation, interactive level of detail management, and animation interruption. Release 2 of *VR4Max* will be a free upgrade from the original.

Prices start at 550 euros (about £340 or $490) for the single-user viewer and 2,200 euros for a full version with *3ds max* interface.
CONTACT: www.vr4max.com

Pixar.com

The world leader shows its shorts online

While you wait for *Monsters, Inc.* to appear on the big screen and no doubt raise the bar for animated 3D storytelling, you might as well while away the time with a look at Pixar's new website. As well as info on the feature film animation that has made its name, the company has made some of its excellent short film material available, such as *For the Birds*, *Luxo Jr* and *Geri's Game*. Hitherto these were difficult to see unless you were at the right festival at the right time.

CONTACT: www.pixar.com

Turbo Squid reborn

Turbo Squid enhances its assets with new-look site

3D is a many-tentacled endeavour. Turbo Squid, the online asset marketplace, has relaunched its site with communities for each authoring application. *Poser*, *LightWave*, *3ds max*, *XSI*, *Shockwave 3D*, *Maya* and the fledgling *gmax* are all represented, with emphasis on the easy location of assets and good deals. A new Mac beta of the *Turbo Squid* software is also available, along with the revamped PC software. Both downloads are free to a good home.

CONTACT: www.turbosquid.com

TINYPLANETS WINS AWARD

Once again, the London production company Peppers Ghost graces the pages of *3D World*. This time it's for winning an award at the BAFTA interactive entertainment awards ceremony, for www.tinyplanets.com. This is an innovative children's Website which scooped Best Entertainment Site. Aimed at three- to six-year-olds and hosted by the pleasingly unhinged duo of Bing and Bong, the site attempts (mercifully free of drug references) to introduce children to the wonders of how things work. It makes use of some extremely stylish visuals created using *Flash*, *Fireworks* and *Shockwave 3D*. The site was developed to coincide with the launch of 65 five-minute TV episodes of *Tiny Planets*, soon to be broadcast on CiTV in Britain, and very impressive it is too.

CONTACT: www.tinyplanets.com

Bargain Booze in 3D

Alcohol looks more tempting than ever

The North of England's number-one romantic nightspot is at last blessed with its own Website. It was produced using *3DML*, a language "for creating rich media immersive 3D environments" and is a virtual tour of a Bargain Booze emporium, complete with alcohol-related merchandising and products. The author is Inside Track, in Warrington.

CONTACT: www.bargainbooze.co.uk

web 3d

VIRTOOLS FOR MAYA

AliasIWavefront and Virtools have announced the Virtools exporter for *Maya*, which enables the exporting of 3D models, lights, cameras, materials, textures and animations into Virtools Dev 2.0. *Maya*'s bones, skin, and vertex colors features are also catered for, and you can drag-and-drop behaviours from the development kit's library onto these exported objects to create interactive 3D applications. The exporter is available for download.

CONTACT: www.virtools.com

CYCORE AND MARKETTOOLS PARTNER

MarketTools, a specialist in market research on the Web, and Cycore, the maker of *Cult3D*, have agreed to integrate *Cult3D* software with the MarketTools' *zTelligence* research platform so that researchers can present realistic 3D images within online research studies.

CONTACT: www.markettools.com www.cycore.com

SWIFT 3D LW FOR MAC

Mac users of *LightWave* can now join *XSI* and *max* users in worship of *Swift 3D 2*'s fancy, parsimonious and speedy RAViX-powered vector-exporting charms. The plug-in costs $295.

CONTACT: www.erain.com

STRATA 3D ADDS FLASH

The newly released Rich Media Edition of *Strata 3Dpro*, version 3.6, now features the ability to render 3D images and animations and export them in vector formats such as Flash. Strata emphasises the compact file sizes that result from the new version, which costs $895.

CONTACT: www.strata3d.com

ANIPAK FOR TRUESPACE

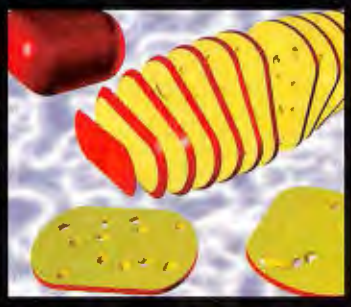
Caligari has released *Anipak*, a collection of 11 animation-related plug-ins for *TrueSpace 5*:

- ***Dreamotion Posemixer* is a non-linear mixer for skeletal animation;**
- ***Skeletool* provides interactive forward-kinematics control for IK skeletons;**
- ***IK Anchor* keeps constrained edges locked in position to enable precise body positioning;**
- ***Dynawave*, for liquid simulations;**
- ***Spacetime Morph 2* for expressions, morphs and blending objects;**
- ***Puppeteer-tSX* for character animation;**
- ***Meshforge 5* for real-time deformation;**
- ***vcTek* helps design complex machines and vehicles, and**
- ***vcCut* hacks up *Truespace* objects into equal proportions and organises them to your heart's content.**

Finally, *Marvellous Motions* is a library of 31 motion-capture movements to incorporate into your animations.

Should keep the *TrueSpace* cadets gong for years, and the whole *Anipak* costs a mere $199.

CONTACT: www.caligari.com



THE KILLER BEAN RETURNS

Longtime readers of *3D World* may remember issue 09's coverstar, Jeff Lew's *Killer Bean*. Created by the masterful Mr Lew over a period of years, on a home PC with the underrated low-budget *Hash: Animation Master*, the three-minute Woo-inspired tale of a kung-fu coffeebean having to fight for the right to rest has become one of the most popular animations on the IFilm website.

Now there's a sequel. Expect to see the bean back in action online within the next few months. In the meantime download the *Killer Bean 3* trailer.

Jeff outlines the differences: "*Killer Bean 3* will have more of a visual style to it than my previous shorts. I've learned a lot since *Killer Bean 2* and I feel more comfortable and free with experimenting.

"It will definitely be more of a directorial showcase than the other two."

CONTACT: www.jefflew.com

pinocchio 3001

CinéGroupe, a production company in Montréal, is to bring forth a futuristic version of *Pinocchio*– no word of a lie. The 80-minute fully-3D animated feature is scheduled for release in 2003. The company will author the film using 55 seats of *Softimage|XSI*.

CONTACT:
www.cinegroupe.com

NatFX plant modeller

Green-thumbed animators can grow plants from virtual DNA

3ds max users will soon be able to populate their scenes with expertly modelled vegetation, courtesy of *NatFX*. With the botanical modelling software, previously available only for *Maya*, green-fingered animators can animate and model all aspects of a plant, based on automatically calculated parameters. Each model in the plant library is like a seed containing the virtual DNA of each plant species, so *NatFX* expresses the genetic code, calculates the plant architecture and models it in 3D.

Animation is a breeze, too, with properties such as wood flexiblity, strength of leaf attachment and stems faithfully reproduced for each plant and brought to life with a few mouseclicks.

Within *Maya*, *NatFX* is tightly integrated and optimised, and its online library is constantly updated with new virtual seeds. *NatFX* for *Maya* costs $1,900 for the Base version and $2,900 for the Ultimate version; the difference is that the Ultimate version has enhanced 3D billboarding, with which users can place, move and manipulate very deciduous scenes.

The *max* version is expected to cost the same and be available from December. A free demo CD can be ordered.

CONTACT: www.natfx.com

SPLUTTERFISH RELEASES BRAZIL

***Brazil*, a fully integrated rendering alternative for *3ds Max* and *Viz*, is now on the market. Splutterfish, its developer in Venice, California, emphasises that it wants to provide a high-end rendering system at a reasonable price, and is uncompromising in its belief that renderers should provide sufficient quality to be intercut with live-action footage. A full featurelist is available online, along with examples of the renderer's capabilities.**

Until the end of 2001, SplutterFish is offering an introductory price of $1,200 for its Artist bundle (one workstation and two render slave licences) and $750 for the Renderfarm bundle (four render slave licences).

CONTACT: www.splutterfish.com

Stitcher 3.1

Powerful panorama program procreates progresses

Realviz has again tweaked its panoramic imaging software, *Stitcher*, which was recently used to great effect to create landscape imagery in *Captain Corelli's Mandolin*, among other productions.

Version 3.1 of the software, with which film, print, 3D and Web artists can seamlessly combine horizontally and vertically overlapping photos into wide-angle 360-degree panoramas, has improvements in both workflow and output. Specifics include colour at 16 bits per channel, template options for automated stitching and rendering, panorama conversion features for render retouching, thumbnail rotation, batch rendering and improvements in *QuickTime* export.

Stitcher is available for Mac and Windows at $495 for new users, $199 for upgrading from version 1.5 or earlier, and free for users of version 3. Updates are available online. Realviz (slogan: "We bridge the gap between 2D and 3D") has headquarters in Sophia Antipolis, France.

CONTACT: www.realviz.com

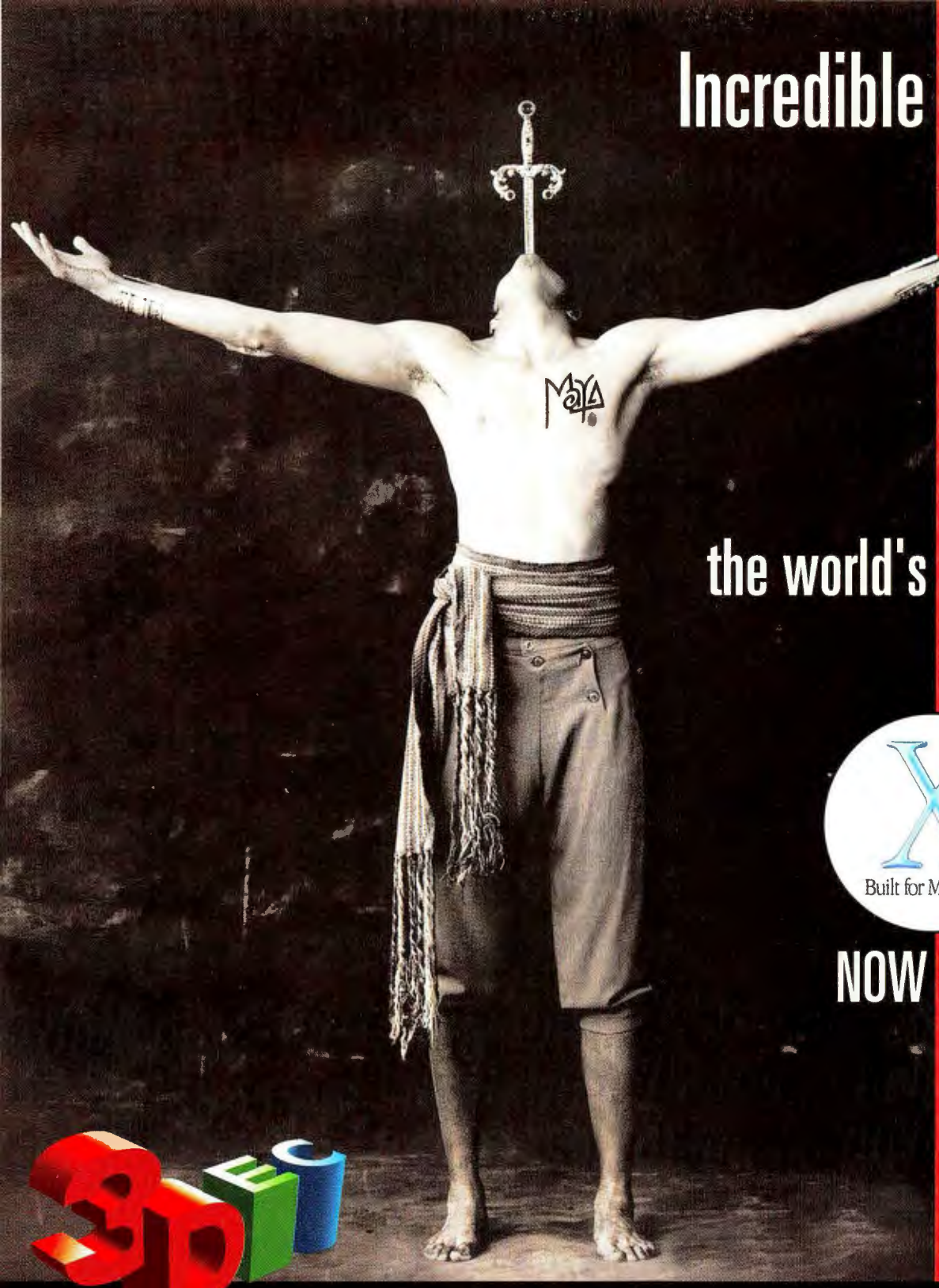
GNOMON TUTORIALS

The Gnomon workshop, a Hollywood training facility specialising in training videos, has added a further six 110-minute videotapes to its range, which now totals 24.

Two of the new releases concentrate on IK and character rigging in *Maya*, and the other four get to grips with the complexities of *Maya*'s dynamics system – from rigid bodies and constraints through to particle instancing. The vids are available in both PAL and NTSC formats. Typical price is $69.

Check out the online tutorials.

CONTACT:
www.the-gnomon-workshop.com



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views

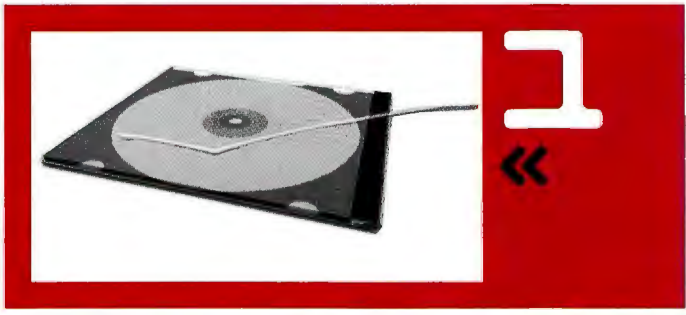
To express an opinion on anything related to 3D creativity, raise an industry issue or comment on matters of editorial policy, simply send an e-mail to **3dw.views@futurenet.co.uk**

SUBJECT: GLUE 2

I am writing to help out people like Harry Pattinson, (issue 18), with regard to the glue that holds the CD case to the cover. All you have to do is pull the glue towards you rather than directly upwards. The whole strip comes off and can be rolled into a ball that can be used to annoy colleagues.

Please excuse the awful image, but I am in a rush... Cheers for an excellent mag!

Rob Oliver, Volume, www.volume.co.uk



In the November issue there is an editorial comment about the glue used to hold the CD to the magazine. It ended with what sounded like a plaintive whimper for help. I don't know how the banks do things over in the UK (I'm assuming since you people drive on the wrong side of the road, everything must be all weird) but when the banks here send us Canadians our new client cards they use an odd rubbery thermosetting glue to hold it to the letter. Peels right off the plastic card, and you can also get it off the letter if you try. Maybe this is the answer. Personally I don't know what all the fuss is about. My CDs don't come attached at all, to the point of being occasionally absent. Glue? What glue?

Bryan Steinnagel, via e-mail

Glue is obviously a hot topic among the 3D community. Coming next month: which package is best for rendering adhesive solutions? Don't miss our exclusive eight-page investigation... (etc etc). Oh, and by the way, I think you'll find WE drive on the right side of the road... which is the left. If you see what I mean.

SUBJECT: POSER REDUX

I'd like to comment on the letter from Anonymous (Newcastle) in the Views section of issue 17, regarding the *Poser* work in the Exhibition area. Obviously, Mr Newcastle, you wouldn't have written such a letter if you'd tried to work with the program. Granted, there are those who use the "canned" image as you say, but we were all there at some point in our lives or careers. I strongly believe that all artists deserve recognition for their efforts. I would challenge you to find something worthwhile in every image you see and remember: a bit of recognition for work done now creates the artists of tomorrow. *Poser* and *Bryce* may not be the best, but please don't discount what someone can do with them.

Donna D'Amelio, via e-mail

As we've said before, it's horses for courses. Just as not everyone who uses Softimage *or* Maya *is an artistic genius regularly churning out meisterwerks, not everyone who uses* Poser *is a spotty adolescent obsessed with oversized mammary glands. They just happen to be the most visible* Poser *users, unfortunately.*

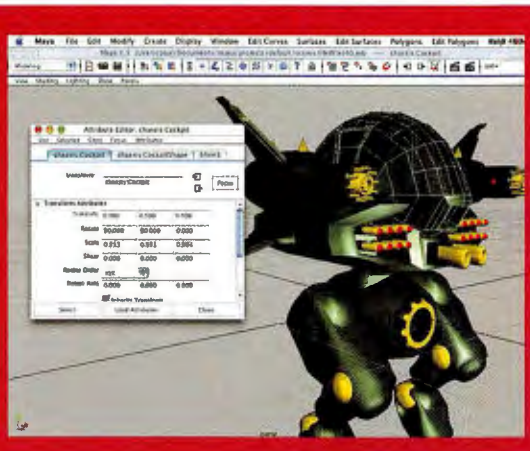
SUBJECT: SPOON-FED DROSS

I work in the industry as an animator, and am also passionate about film. I read your comments about *Final Fantasy* in your news story in issue 19 and just have to comment.

Pardon me, but I think it's fair to say *Final Fantasy* failed because the story was shite. I've seen it so many times now. No matter how spectacular you make the effects the underlying story needs to carry you through it all. No matter how much stuff you blow up, disintegrate, whatever – you can't hide an appalling plot. Ludicrous and overblown does not a good film make!

Now what depresses me is that studios jump on the next bandwagon rather than let an original idea have a chance. Or if they get their hands on an innovative director, they pressure the studios to film a 'safe' movie – by the numbers, to please the masses. Sometimes film-making is a gamble, but if you have directors who know their stuff, then let them do their job. I agree the marketing hype does help to get the punters in, but the word quickly gets round despite the hype. That works both ways.

Unfortunately what we generally get is spoon-fed dross. Studios fail to realise that some moviegoers have a brain and hate being



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CONTRIBUTIONS TO OUR COVERDISC
matt.gallimore@futurenet.co.uk

FROM THE FORUMS Have your say or get advice in our forums at www.3dworldmag.com

SUBJECT: 3D STUDIO 4

c-jack:
I'm a complete amateur (as you can probably tell) and I have a problem. In *3D Studio 4* I have a particle array set up to simulate an explosion using the object's chunks. This is most definitely a stupid question, but can I freeze the particle animation (stop the fragments expanding) at a certain frame and then rotate it? (a bit *Matrix*-influenced). Be nice and remember I'm a beginner.

d4mo replies:
I haven't tried this but I assume you could keyframe at the point where you want to start your camera rotation and then animate the camera from there. To do this, select the pArray and then right-click on the frame slider. You will probably have to stop the pArray emitting just before your camera rotation. Hope this helps.

c-jack replies:
It sort of helps, and thanks, but my problem is telling the pArray to stop emitting so I can animate the camera without the pArray chunks moving at all. I tried reducing the particle speed to zero, but that doesn't stop the particles – it just makes them rotate in situ.

EssieP replies:
I think you can use File>Hold to save a snapshot of the particles, then Menu>Fetch, which should in effect import the particles as a mesh. Set them as a different object, not the original particle-emitter, and in track view use the visibility track to make them appear at the right time (the same time that the particle array disappears – using another visibility track).

SUBJECT: TO MAYA OR NOT TO MAYA...

badders:
Just wondering what people's opinion is regarding *Maya*. We are about to buy some nice shiny new kit for our company and want to be able to use it for 3D work, mainly corporate logos, training illustrations etc. We have been using *3ds max* for the past couple of years and are familiar with the basics of the program. But we are now using Apple Macs for video-editing and of course *3ds max* is only for Windows. So we either buy a couple of PCs and run *3ds max* on them, or get *Maya* for Mac OS X. We were at the Computer Arts Live exhibition the other week (way too much Adobe coffee!) and had a good look at *Maya*. It certainly looks as if it delivers a professional product, but I'm concerned at the possible steep re-learning curve involved. Has anyone else made the transition from *Max* to *Maya* – or what are your thoughts generally? All opinions much appreciated!

Dean Wray replies:
I work for a games and broadcast company. About a year ago I switched my company to Maya. *We were all* max *people! For our industry* Maya *suits us well; however, the price difference is as steep as the learning curve for some (not all) individuals.*

As for your requirements – logos and the like – I would rather stick with max *(as* Maya 4 Complete *is easily the cost of* max *and a good PC). Or possibly consider* LightWave. *I'm sure there are numerous less-expensive 3D applications for the Mac that will suit your needs better for cost!*

But hey, if you want the world's best, hell yeah! Get ten copies and churn out short animated films!

Hope this helps!

patronised. The critical press has some part to play in all this. They too often overrate films because it may be better, relatively, than another. What they should give us is honest opinion so that maybe studios will cotton on to the key fact: that the only true winning formula is a good script. Ultimately I think studios could save a few quid on the effects and spend them on the plot.
Jerry Corda-Stanley, The Computer Film Company, via e-mail

I tend to agree. It's what savvy animators have been saying all along – technical ability is nothing without strong characters, story and script. Pixar clearly understands this and so does PDI. Technically, Tron *was cutting-edge but, frankly, its story was a confused mess with weak characters, and it suffered the same fate when first released. But then, looking at this year's crop of mega-expensive 'blockbusters', all of which seemed to have died a death at the box office, maybe that nebulous mass The General Public ain't so easily fooled after all...*

sorry

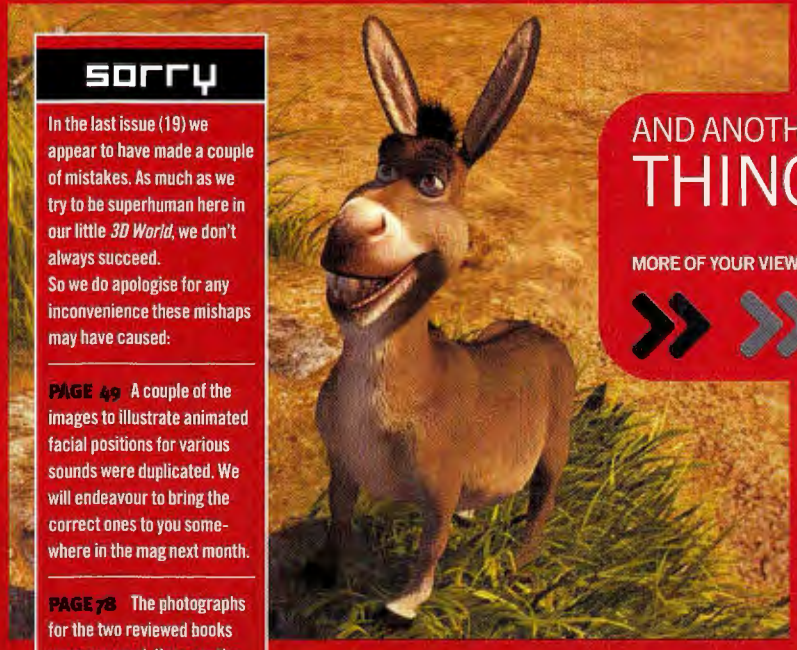
In the last issue (19) we appear to have made a couple of mistakes. As much as we try to be superhuman here in our little *3D World*, we don't always succeed.
So we do apologise for any inconvenience these mishaps may have caused:

PAGE 49 A couple of the images to illustrate animated facial positions for various sounds were duplicated. We will endeavour to bring the correct ones to you somewhere in the mag next month.

PAGE 78 The photographs for the two reviewed books were swapped. Here are the ratings we intended:

3ds max 4 for Windows: 3 STARS

Inside 3ds max 4: 5 STARS



AND ANOTHER THING...

MORE OF YOUR VIEWS ON PAGE 94

TOP LEFT Now there's service – not only a handy tip on removing glue but a render to go along with it.

LEFT *Maya* may be a marvellous bit of kit, but for making logos its price may also be as steep as its learning curve.

ABOVE The success of *Shrek* against the failure of *Final Fantasy* bears out the old adage that in animated films The Public really cares only about story and characters. Let's see what happens to *Monsters Inc.*

monsters, inc.

Pixar discusses its latest labour of love, a comedy creature feature using the studio's most advanced CG techniques yet

BY MARK RAMSHAW

The arrival of a new movie from Pixar is as much a major event for the graphics industry as it is for moviegoers. From *Toy Story* onwards, the studio's output has combined peerless cutting-edge graphics technology with universally acclaimed storytelling talent. It's an approach that has made the 15-year-old company the most widely acclaimed and best-loved CG animation studio in the world.

Monsters, Inc. is the latest full-length film from Pixar, the studio's fourth and the second in a five-picture deal with Disney. The previous movies have dealt with toys and bugs, now it's the turn of the monsters in the closet. *Monsters, Inc.* opens up the world of Monstropolis, a town teeming with strange creatures and home to the largest scream-processing factory in the monster world. Here monsters use door portals to venture out into the human world, scaring children and collecting their screams for use as a natural power resource. When top scarers Mike Wazowski and James P Sullivan (Sulley) accidentally let a young girl back into Monstropolis, all hell break lose as the monsters frantically and farcically try to deal with what they believe to be a toxic life-form. With Mike sporting just the one large eye, Sulley standing eight feet tall and covered in shaggy blue-green fur, the movie is home to Pixar's most outlandish CG creations yet.

Monsters, Inc. marks the feature-directing debut of Pete Docter, a Pixar veteran whose previous credits include the role of Supervising Animator on *Toy Story* and story contributions to *A Bug's Life* and *Toy Story 2*. Co-directors on the project are Lee Unkrich (Film Editor on *Toy Story* and *A Bug's Life*), and David Silverman (whose directing credits include episodes of *The Simpsons*). Also involved are Andrew Stanton, screenwriter of all Pixar movie projects to date, and John Lasseter, Executive vice-president of creative and director of *Toy Story*,

ABOVE Mike and Sulley pass through the factory's outlandish monsters. While the principal characters were built first as maquettes and then fine-tuned using Pixar's proprietary animation system, a virtual kit technique was used to put together around 50 secondary monster designs. "The buddy thing is like an extension of Laurel and Hardy, though that can be tricky to pull off with CG," says Pete. "Luckily we have such great actors that we're able to lean pretty heavily on their talents."

TOP The dynamic duo, Sulley and Mike, give the thumbs-up before heading through a portal doorway to an unsuspecting child's bedroom. "We were definitely aiming for a high degree of physical comedy, keeping it fun and interesting to watch," says Director Pete Docter.

MUCH OF THE EARLY WORK INVOLVED APPLYING AN INTERNAL LOGIC TO THE BASIC PREMISE

A Bug's Life, and *Toy Story 2*. Lasseter was also responsible for the string of Pixar shorts produced in the 1980s.

"I do think this movie shows an evolution of the technology," says Pete Docter. "We certainly couldn't have done this five or six years ago. Back in the time of *Toy Story* the computers were doing plastic really well, so we decided to make a film about plastic. But it's taken until now for us to really be able to do characters that are much softer. And this time around, fur is the really big thing for us."

Pete originally conceived the story back in 1996. "I brought in the basic story, but it's been such a group effort, forming the idea that monsters scare kids for a living, working in a factory and clocking in and out. The clichéd thing would have been to stay with the kid, but we realised it would be great to show things from the monsters' perspective."

"I was the one who took the bunch of ideas and stitched it together, Frankenstein-ing it," adds Andrew Stanton. He put together the first draft in the summer of 1998. "It certainly wasn't written in a vacuum. We each all end up getting credit for the area in which we're predominately effective, but these movies are always a group effort in a way I always equate to Monty Python's way of working."

This group included Ralph Eggleston (Director of *For the Birds*), Jill Culton, Jeff Pidgeon, and co-writer Dan Gerson, who worked on the script during the last 18 months of the production (freeing Andrew Stanton to assume directing duties on next Pixar movie release, *Finding Nemo*).

Andrew explains that much of the early work involved applying an internal logic to the basic premise, such as coming up with the way monsters scare children in order to

AWARDS AND CREDITS

ABBREVIATED CREDITS: *Luxo Jr* (1986), *Red's Dream* (1987), *Tin Toy* (1988), *Knickknack* (1989), *RenderMan* (1989), *Toy Story* (1995), *Geri's Game* (1997), *A Bug's Life* (1998), *Toy Story 2* (1999), *For the Birds* (2000), plus ad spots for Coca Cola, Levi's, Listerine.

ABBREVIATED AWARDS: San Francisco Film Festival Golden Gate Award for *Luxo Jr* (1987), Academy Award Best Animated Short Film for *Tin Toy* (1988), Anigraph, Prix Ars Electronica Golden Nicas for *Red's Dream* (1988), Los Angeles International Animation Celebration: Computer-assisted Animation First Prize for *Tin Toy* (1989), Barcelona Film Festival First Prize Animation Competition for *Knickknack* (1991), Clio Awards Gold Medal for Listerine Arrows (1994), Annie Award for Best Animated Feature, directing, producting, writing, production design and animation for *Toy Story* (1996), Academy Award Best Animated Short Film for *Geri's Game* (1997), Grand Prix: Animation First Prize for *Geri's Game* (1998), Academy Technical Achievement Award (1998), Prix Ars Electronica Award of Distinction (1999), Academy Award of Merit (2000), Golden Globe Best Picture (Musical or Comedy) for *Toy Story 2* (2000), Broadcast Film Critics Association Best Animated Feature (2000), Imagina Grand Prix Award (2000).

ABOVE In contrast to previous Pixar films, *Monsters, Inc.* features softer colour schemes and subtler use of light and shadow.

obtain their screams as a sort of fossil fuel. He also focused on the movie's central themes, including that of overcoming inner fears and the way Sulley takes on a parental role to Boo, the young girl running amok in Monstropolis. "A lot of us here are either new or long-time parents, so we had the idea of looking at the whole idea of being a new parent," he says.

"I think the collaborative way of working is one of the keys to Pixar's success," continues Pete. "It doesn't matter where an idea comes from, if it's good we'll work it into the film. That's also why the production process is so long!"

"All our movies have an incredibly long period during which the story evolves," adds Andrew. "I used to think it was because we were new at the job, but really there's nothing easy about making a story work well. Of course, if you do it right then from the outside it looks effortless. The Italians call it *spretzatura*, 'the art of concealing the art,' though for me it's more the art of concealing the pain!"

While previous Pixar movies have been at least partially rooted in our own world, the environment and characters of *Monsters, Inc.* are completely fictional. This naturally gave the team complete design freedom, with the ability to go completely wild with creature designs.

"It actually started to get the better of us in the beginning," admits Pete. "We were missing out the opportunity to hook people in and give them something to relate to, especially with our ideas for including all sorts of weird stuff in the monster city. John [Lasseter] came in and said we should think more about the logic of it all, so we went back and worked with our own world as the blueprint, imagining our cities as they might be if monsters lived there. We might have an apartment, but it's built to support an 800lb guy. And instead of decorative wallpaper it might have claws and teeth."

Lee Unkrich is one of two co-directors on the project. "I stepped in to support Pete and help out primarily with the editing, staging and cinematography," he explains. Lee comes

FACTFILE

FORMED 1986

EMPLOYEES 550

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SULLEY, MIKE AND BOO ARE FAR MORE COMPLEX THAN THE LIKES OF WOODY AND BUZZ

from an editing background, having edited *Toy Story*, *A Bug's Life* and *Toy Story 2* as well as co-directing the latter. "Prior to Pixar I was working with live action, so I find I'm a good fit working with animation-based guys like John and Pete."

"In the early stages we went through a ton of designs for the monsters trying to get them just right," recalls Lee. "Monsters don't exist, so obviously you can do just about anything you want. There was a time when Mike had tentacles instead of legs, I think we always knew he had one eye, but he had no arms. It was fun knowing the sky was the limit, but also have to spend a lot of time figuring out how to make them attractive to an audience. The characters need enough human features that they can emote and act."

Mike in particular proved something of a challenge, possessing just the one large eye. "It's surprising how many things we do based on having two eyes and eyebrows. The artists to do a lot of experimenting to come up a model that would enable them to get subtle acting across."

The primary designs for the monsters started out as sketches, eventually making the transition to sculpted maquettes. These were then digitised to use as a blueprint for 3D modelling, with much further re-shaping and fine-tuning handled in Pixar's proprietary *Marionette* software. A time-consuming process, it would have been too prohibitive to use this method for the secondary monster designs, so 50 creature designs were created using an on-screen virtual kit system.

Using Pixar's own proprietary animation system, dubbed *Geppetto*, the modellers added more controllers to the models than in any previous production. Sulley, Mike and Boo are far more complex than the likes of Woody and Buzz, and even

RE-ANIMATOR

Co-director of *Monsters Inc*, Lee Unkrich explains the subtle art of scene alteration

"You try not to make any script changes after you've animated a scene. That's really the point of the story reel. But what happens is at a certain point you have to animate your movie. Pete worked on this a long time in the beginning, but you have to start shooting at some time, even if you have story issues that linger, unresolved. So you animate the scenes you can, and continue to work on the story. And what's often the case is that any changes create problems in those scenes you've already animated. Or they're no longer as strong as they could be. It's not so much a case of problems arising from the quality of the storytelling as working to a schedule.

"In live action if a scene isn't working you just cut it. Or if the finances allow, you go back and redo it. In our world, it's not quite as expensive as gathering actors, but it's still not without cost. The thing is, we work on these films for so long here that we don't want to compromise the storytelling in any way. And given our lineage, people have come to expect a certain level of storytelling from us."

LEFT One of just 22 sets featured in the movie, this city street broadly resembles one from the human world, bar a few suitably monster-ish details (note the sign for the pedestrian crossing). Lee Unkrich explains: "We had really great voice-acting from Billy and John and the other actors, and of course when they're reading their lines you can see things happening in their head. We videotaped the recording sessions, and so were able to steal nuances and expressions from them. Andrew Gordon, the lead animator on Mike, took quite a few expressions and cues from Billy."

have almost 30 per cent more controls than the Al model from *Toy Story 2*.

"I try to keep the models under control as we're building them," says Pete. "Too complex and it just slows things down, making them more difficult to animate. Although these models are far more complex, you don't necessarily need a whole lot of physical control to get good results. While Woody is a far simpler model than the ones here, he's still really expressive. You only have to look at *The Muppet Show*, at a character like Fozzy Bear, to see how little control is needed to do comedy. We don't even apply the facial animation until we're almost done with the body stuff. That's the key, to keep the animation as broad and physical as we can."

Pete's own experience animating undoubtedly gives him an advantage when dealing with issues of model complexity and nuances of character performances. "I generally know if I ask an animator to do something whether it's going to set us back a week or whatever. But generally I talk to the animators in the same way a director would talk to an actor, discussing things in terms of attitudes rather than specific animations."

During the period in which Andrew worked on the script, neither John Goodman or Billy Crystal had been cast in the roles. As Lee Unkrich says, "The characters and the model designs were already firmly in place, although it wasn't really until Billy came on board that Mike became the guy you see in the final movie."

"When you have someone like Billy you just let the tape run," adds Andrew. In the past Pixar has recorded each character's lines in isolation, but for *Monsters, Inc*. Billy and John got together in the studio. "We hadn't had a good history of recording people together, so we made the mistake of assuming it wasn't a good thing to do. But Billy and John had this real chemistry, and so by recording them together we got some great improvisation."

"They'd just go in there and give us all this new material, dialogue with a real sense of back-and-forth to it," adds Pete.

On past projects the choice of actor has sometimes influenced the look of a character. Slinky Dog in *Toy Story* had its ears altered to lend it a hound-dog expression to match Jim Varney's voice, for example. Here though, any visual influences are more to do with John and Billy's mannerisms.

"Whenever we do recording sessions we videotape them," explains Lee. "It's purely so the animators can watch the actors as they work, often getting inspiration. You can see it with Joan Cusack's expressions coming through in Jessie in *Toy Story 2*, and I think people will see the same thing here with Mike and Sulley."

Pete estimates that around 15 recording sessions were required, spread over a period of more than two years. "In that time they had finished something like 85 live-action movies, really making us jealous," he laughs. "The thing is it took us about two years to get the story to the point of casting

TOP "One of the things that really interested me in sticking with Sully and Mike's perspective was the psychology behind monsters," explains Pete Docter. "Generally they are a way of naming an unspecified fear. Especially as a child, there's the idea that you create a monster to represent what you're afraid of. As we developed that we felt the underlying thing should be fear, but came up with the idea of flipping the whole thing on its head, having the monsters afraid of kids. And we then pushed the kid, Boo, to be as sweet and cute as possible, so it becomes even more absurd that the monsters are running amok over this two-and-a-half-year-old girl. Plus it creates a nice contrast between Sullivan and Boo, this 1500-pound guy and this 25-pound girl."

TOP RIGHT Mike (voiced by Billy Crystal) has a hot date with receptionist Celia (played by Jennifer Tilly). When Celia kisses Mike, so do the serpents on her head. "We always keep in mind the need to balance the monster aspect with the performance," says Pete Docter. "Mike with his one eye looks unique, but he still has expressions and attitudes you can relate to."

the actors, but even after that the story changed quite a bit. We would change things, and these would have a ripple effect backwards and forwards, forcing us to go back to record fresh dialogue for the same scenes, sometimes a whole load of times."

"The production process certainly went smoother than on *Toy Story 2*," points out Lee. "With that we revamped the story at the eleventh hour. The problem is we set such high standard for storytelling. We want to make it as entertaining as possible, and to get as many laughs as we can, so we have to go back and make those changes. And that's what we did on this movie, too."

One scene that proved particularly difficult to get right takes place in the Himalayas, with Mike and Sulley banished to the wastes and taken in by none other than the Abominable Snowman.

"We reworked it so many times it started to get silly," admits Lee. "But we needed to get it right, as the scene is crucial to the whole film. In it we bring the buddy relationship between Mike and Sulley to a point where it's not clear how they'll ever get back together, and yet at the same time there's the yeti providing comic relief. We had countless iterations and actually animated many of them. But once we got it right, and had Billy and John record the new lines it gave us such an exponential leap."

In the six years since the premiere of *Toy Story*, Pixar's rendering technology has clearly improved enormously. In that time *RenderMan* has been transformed with new features such as Subdivision Surface support, the R&D department has developed techniques for cloth, and character models and environments have become far more complex and subtle. Even in comparison to *Toy Story 2*, released two years ago, *Monsters, Inc.* represents a massive leap, requiring some 2.5 million rendermarks against the previous film's figure of 1.1 million. Yet, despite many of the scenes in *Monsters, Inc.* featuring the little girl Boo, Pixar hasn't opted for a near-photorealistic approach to human modelling.

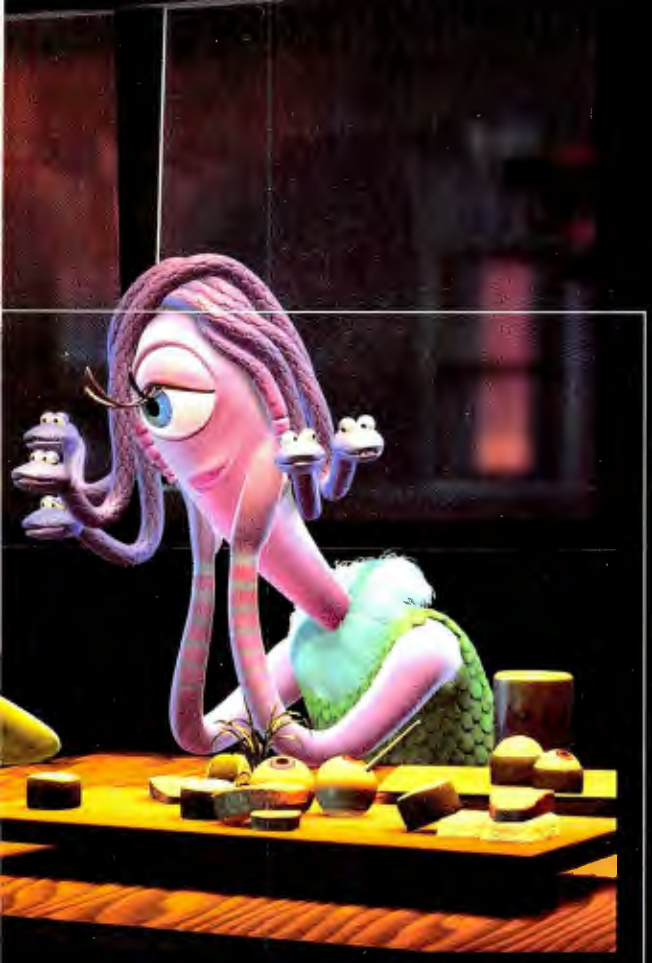
"Beyond the technical exercise I just don't get the point of replicating humans accurately in CG," says Lee. "The closer you get, the more you notice things aren't quite right. And even if it becomes possible, what's the point? Sure, it has uses in replacing stuntmen, making it possible to film scenes without endangering lives. But otherwise you might as well just use a real person."

LET'S TALK ABOUT SETS

More than 35 animators worked on *Monsters, Inc.* with single animators focusing on the performances of the primary characters Mike Wazowski (Andrew Gordon), Sulley (John Kahrs) and Boo (Dave DeVan). Thousands of shaders were also developed to give a completely new, stylised and textured look to the 1500 shots in the movie.

Locations include Boo's bedroom, the Yeti's blizzard-bound hideaway, and a sushi restaurant in the monster factory cheekily named Harryhausen's. For this film Pixar also introduced a set-dressing department, to assemble and lay out the various digital objects in each area.

Additionally, Art Directors Tia Kratter and Dominique Louis were on hand to advise on colour palettes, lighting and shading. Tia spent time analysing welded metals for the factory scenes, for example, and studied llama, yak, goat, and sheep fur for use when crafting Sulley's appearance. Louis created mood-establishing pastels to depict each scene, giving the lighting department reference when setting up final shots.



PEOPLE OFTEN WRONGLY USE THE TERM PHOTOREALISTIC TO DESCRIBE ENVIRONMENTS

"Our philosophy is therefore to go for a more stylised look. The fun with CG lies in creating fantastical things that don't exist in our world, but to use shading and lighting to make them somehow appear real," he continues.

It's an approach that also impacts on the environments depicted in Pixar movies. People often wrongly use the term 'photorealistic' to describe them. In fact they're highly stylised, but detailed enough to allow the suspension of disbelief on the part of the audience.

"Rather than just have sterile elements everything feels warm and used," agrees Lee. "In this movie there's some very beautiful lighting. I'd say it's a darker film. There's a lot more contrast, but in beautifully painterly way. It's not just down to shading and lighting, it's also how the sets are arranged. We try to make all of the spaces look used and lived in, ensuring the backgrounds are as richly detailed as possible."

"For *Monsters, Inc.* we developed a system for animating Boo's shirt," says Lee. "It's a major extension of the cloth simulation we first created for *Geri's Game*, ensuring that the material drapes in a very natural manner without the animators having to worry about it."

A more radical technological advance can be seen on Sulley, who sports a splendidly furry body. "Other people have obviously done it before, and so have we to a lesser extent. But here it's visible in almost every shot, so we needed it to look and move very realistically, without bogging the animators down."

"We knew that we'd need ability to do fur for the monsters, so I wanted the technical guys to come up with a way of doing it as a post-process, so that the animators would be free to work on the acting, not worrying about the fur when setting poses," says Pete.

The solution lets the animators concentrate on getting the model to act, with the results then run through a process that adds and animates the hair corresponding with body movements underneath. "There are generally a few tweaks that need to be done, but it's largely an automated procedure," adds Lee. "From a technical perspective, dealing with cloth and hair were certainly two of the biggest challenges. There's also a sequence depicting a giant door vault, with 5.7 million individual closet doors visible on hundreds of mile-long conveyors."

"That was such a technical challenge to render," Lee continues. "It's definitely the most complicated thing we've ever done. But then the biggest challenge is never really a technical one for us. The most difficult thing is and has always been telling a good story. We're using all this cutting-edge CG, but our success or failure really comes down to whether we tell a good story or not. All the most beautiful computer graphics trickery in the world can't make up for a weak story."

Monsters, Inc. launched in USA cinemas on 2 November. It will premiere in the UK in the new year. For more information about the movie, and other Pixar films, visit www.pixar.com

ABOVE Sulley's blue-green and purple body hair is composed of almost three million individual strands, the proprietary fur-dynamics system giving full control over density, lighting and movement of each hair. Another program, called *Deep Shadowing*, is used to cast individual shadows for each and every hair. The same automated animation systems are used to generate Boo's hair and pigtails, while her clothing is automatically animated using a system built around techniques first developed for the 1997 animated short *Geri's Game*.

perspective

FIRST

practice makes perfect

Playing the piano and using a computer are more closely connected than one might think (and not just because both have keyboards) **BY MARK BRIERLEY**

Music and animation: two disciplines that share the common core attributes of rhythm, structure and context. All well and good, but both are potential victims of the dubious charms of electronica and the *soi-disant* labour-saving attractions of associated digital paraphernalia. In the same way that a musician is not just anyone with 128MB of RAM and a sampler, an animator most certainly is not an animator until he or she has sweated for a few years over basic principles and practices well away from the workstation. This, as I see it, is the main stumbling-block for the next generation of animators: "Too much technology makes Jack a dull animator."

THE COMPUTER DOES WHAT I WANT IT TO DO BECAUSE I KNOW MORE THAN IT DOES

Allow me to advise you that I'm learning to play the piano. I play exercises up and down the keyboard: I play broken chords, arpeggios and triads; I play major, minor, and chromatic scales in similar and contrary motion; I play through the cycle of fifths while standing on my head and drinking a glass of lemonade.

And why do I do this? Because it will make me a better musician. Not, you'll notice, a better piano-player, but "a better musician". And therein lies the crux of my argument: to enable me to express myself more fluently and effectively in music, the piano becomes a vehicle for the exploration of what goes on within and behind the music.

Similarly, when animating with a computer, my experience as a 2D animator provides the equivalent of all those years of playing scales. The computer does what I want it to do, because I know more than it does, and not vice versa.

Now, in the world of computer animation, the irony lies in the fact that, at the beginning, it's beguilingly easy to have cubes and spheres rocketing around the screen in next to no time. This is very exciting (I should know: after fifteen years of painstakingly honing my drawing technique to be able to achieve the illusion of life on paper, suddenly movement was just a few keystrokes away; I nearly wet myself) and immediately the temptation to award oneself the title of Qualified Computer Animator becomes almost overwhelming (I should know: I did that as well).

But, without a firm grounding in what could be called the basic vocabulary of movement, any work produced will always rely on the software available, and where's the creativity in that?

Practice and application is part of learning: it increases knowledge and improves technique, and – most importantly – it establishes a fundamental and solid grasp of the essentials. And there is no substitute for that. There is NO substitute for that.

By its very nature, learning to animate needs to be treated as a craft just as much as learning to play an instrument does, and that craft has to be exercised if competence is to be achieved. The best animation will always come from those people who understand that the computer is nothing more than a box of tricks, and that the more the computer does for you, the less control you have over what the computer does.

We have nothing to lose but our chains.

MARK BRIERLEY is a freelance animator based in Bristol in the UK, with numerous CG-related projects under his belt, including work for Aardman.

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[It's Everywhere]

NewTek

Image credits: AristoMenis, MeniThings

RIGHT Delgo, the lead character and hero of the film. He's a member of the Lockni clan and attempts to reunite the three feuding tribes on his planet.

Fathom Studios

Independent's day

Atlanta's Fathom Studios is taking on the big boys, producing a CG movie that'll go up against the best the likes of Pixar and Square can offer **BY STUART DREDGE**

The trailer for *Delgo* can be found on the cover CD.

At some stage in their lives, everybody wants to make movies. Just as the Disney classic captivated children in earlier decades, so modern CG pics like *Toy Story* and *Shrek* are inspiring a new generation of kids. What's more, if they don't want to be Buzz Lightyear when they grow up, there's a good chance they want to animate him. The success of these films is also inspiring professional animators, who harbour dreams of 'doing' a Pixar or Square and producing their own animated movie. One such firm is Fathom Studios in Atlanta – but in this case they're actually doing it.

Fathom began life as an offshoot of Macquarium Intelligent Communications, an interactive media studio founded in 1991. After realising that its client-base was split between corporates who wanted business solutions, and ad agencies who wanted more creative work, Fathom was spun off in 1995 to cater for the latter. The *Delgo* story begins with a chance encounter in an office between director Jason Maurer and executive producer Marc Adler. "I walked by Jason's desk one day and saw this animation test he'd created," says Marc. "I was totally blown away by it. All my life I've wanted to make a movie, so that was where it started."

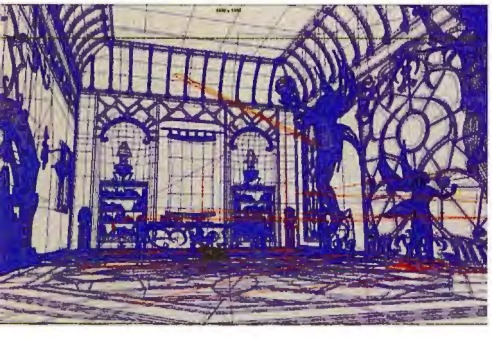
Marc went home from that fateful meeting and produced a one-page outline of what he saw as the crucial elements the movie would need to have. He passed it to Jason and other Fathom staff, who then brainstormed a base treatment, and then a proof of concept. Already, it was clear that *Delgo* would be CG rather than traditional cel-animation. "We have a decade of history," says Marc. "A lot of the technologies we use are CGI, and we've refined our working process over ten years. We have a depth of experience in it, so for us it was a natural extension. If we're gonna do an animated film, let's stick to what we know."

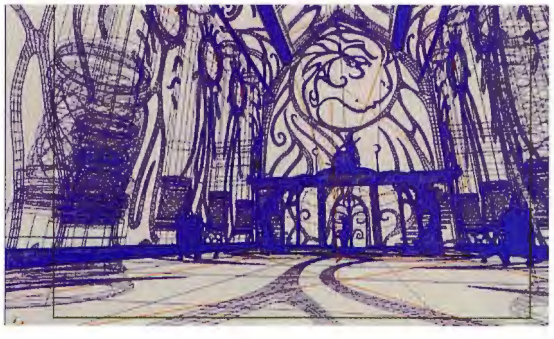
By early 1998, Fathom had completed a 90-second trailer for *Delgo*, showcasing the project's visual style and story elements.

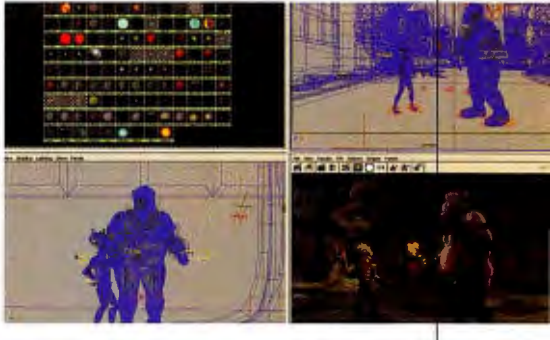
RIGHT The studio's MEL scripting skills are coming in handy, especially for work on the film's elaborate battle scenes.

BELOW From early on in the project's development it was clear that the film was to be a CG movie rather than a cel animation. "If we're gonna do an animated film let's stick to what we know," says Marc Alder, Executive Producer.

BOTTOM RIGHT Fathom is trying to achieve a visual style in *Delgo* that is different from films that have gone before.







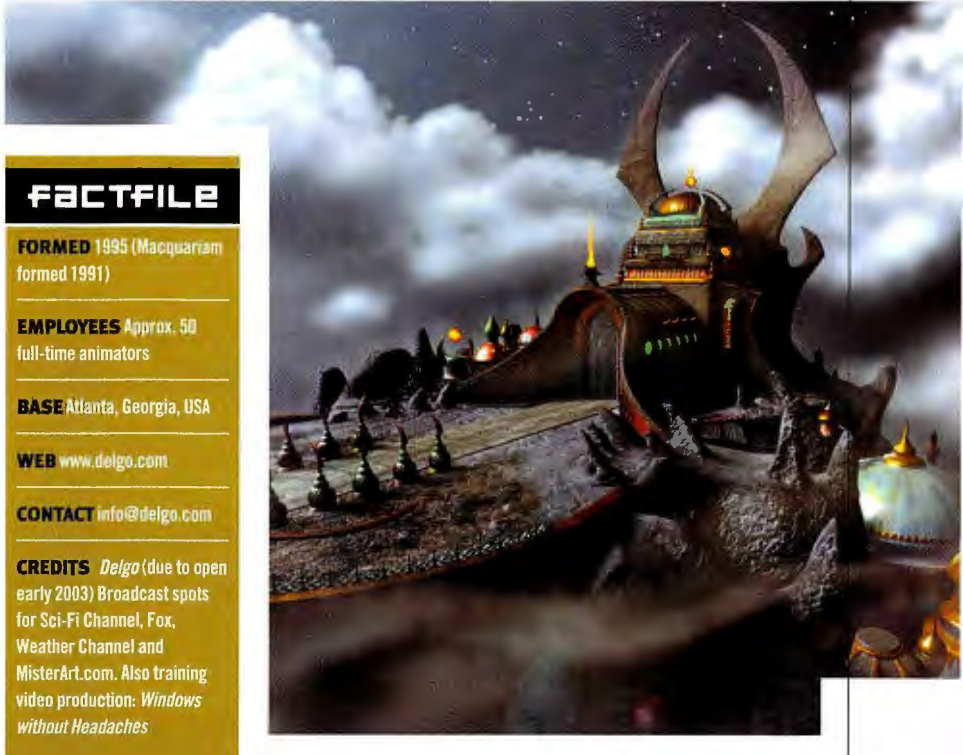
IN THE WAKE OF TOY STORY, CG MOVIES WERE HOT IN HOLLYWOOD

They took it out to show potential investors. In the wake of *Toy Story*'s huge success, CG movies were hot in Hollywood, putting Fathom in a happy position. Investors were found, and the studio started putting together a team.

EPIC ADVENTURE

The result is an epic adventure of some ambition. Set in the mystical land of Imhoff, it focuses on two feuding races: the winged Nohri and the earthbound Lockni. According to the blurb, it's a story of love and war, good and evil, heroism and betrayal, which, given recent events in the real world, are apt themes. "I've always felt that films have a certain social responsibility," says Jason. "Especially animation. The concept of unity among people resonated well with us, and if you look at what's happening in the world right now, that theme is actually really pertinent."

Fathom is striving to ensure the film's visual style and animation represent this scope, and also to look sufficiently different from CG films that have gone before. "The visual style had to echo the epic-adventure nature of the script," says Jason.



FACTFILE

FORMED 1995 (Macquarium formed 1991)

EMPLOYEES Approx. 50 full-time animators

BASE Atlanta, Georgia, USA

WEB www.delgo.com

CONTACT info@delgo.com

CREDITS *Delgo* (due to open early 2003) Broadcast spots for Sci-Fi Channel, Fox, Weather Channel and MisterArt.com. Also training video production: *Windows without Headaches*

ABOVE The visual style of the film had to echo the epic-adventure nature of the script. "It's not really photo-real, and it's not really cartoony. It's a neat blend of the two," says Jason.

TOP RIGHT Fathom is using a variety of industry-standard and off-the-shelf packages to complete the film, from *Maya* right down to shareware apps such as *Terragen*.

SCRIPTING SKILLS

Fathom uses a variety of different industry-standard tools for *Delgo*, from *Maya* right down to shareware apps like *Terragen* and *Framecycle*. Marc thinks this is important. "The team has used off-the-shelf tools as much as possible," he says. "And written libraries of scripts and different middleware applications to have them talk to each other. We're not a software company – we don't write programs for the sake of it. We just want to augment what's already there in the marketplace and make it work for us."

The studio's MEL scripting skills are certainly coming in handy, not least for those tricky yet crucial battle scenes. "As you know, crowd scenes are a pain in the butt," says Jason. "Bora, one of our artists, wrote a MEL script to handle them though. He also wrote an AI that patches into it, so the fighters aren't just flowing about, they're actually fighting each other. It was a really efficient way of dealing with the problem."

"It's a mixture between reality and cartoon. It's become this hyper-reality thing, I guess. It's not really photo-real, and it's not really cartoony. It's a neat blend of the two, and it's pretty fantasy-oriented. I think it fits."

Fathom's decision to go up against the Pixars and Squares of this world is certainly brave, particularly since the firm is based in Georgia, rather than Hollywood. However, as Marc explains, being an independent studio has been a benefit in many ways. "In terms of creative freedom, it's been fantastic. It gives us a lot of freedom in the creation of the story and the look of the film. We don't have to do something just because someone else did it and it was successful. Also, this is script-to-screen for us. We've developed the script, developed the characters, worked on marketing concepts all the way through to adding sound and finishing the movie. We're diving in head-first, no question!"

Marc is bullish about the potential significance of *Delgo*, claiming that Fathom is redefining the rules of CGI animation. "We're an independent studio outside of Hollywood, we're using off-the-shelf software, and we're showing the work on our Web site as it's being created," he says. "If we can pull this off, just imagine what that will mean for the industry, and for all aspiring animators and directors. Today's technologies mean you need a lot fewer people to create an animated feature than you did five years ago. Imagine, in ten or 20 years, one very talented animator may be able to use off-the-shelf tools and create an entire movie on their own."

FANTASY BOOST

Jason estimates that *Delgo* is now halfway to completion; Marc thinks it's a little further. Both agree, however, that the film is due to be completed by the end of 2002, with a view to a commercial release in early-to-mid 2003. It's perfect timing, coming just after the release of the second movie in the new *Lord of the Rings* trilogy. "It's not something we'd planned on," laughs Marc. "But if we're fortunate enough to have the timing work for us, we'll take it!"

DIGITAL DAILIES

Dailies are a traditional element of the film-making process, where key creatives gather at the end of each day to view the raw material. Fathom's flexitime system makes this difficult, as staff come and go at different times of the day. Over the years, the studio has evolved a 'digital dailies' system, which is effectively an internal newsgroup where staff post their latest work and reports, and get feedback from other employees.

One day, Marc had a brainwave. Why shouldn't these digital dailies be made accessible to the general public? Many studios would shudder at the thought of laying bare their internal processes, but Fathom decided to go with it. "There was a lot of internal discussion over whether we should do it," says Jason. "But we decided that it was the right thing to do. It's education. We wanted to share as much knowledge with other film-makers and animators, and also to let the public see the process and understand what goes into an animated film."

IT'S CLEAR THAT DELGO HAS THE POTENTIAL TO BE A TRULY GROUNDBREAKING MOVIE, PROVING THAT INDEPENDENT STUDIOS CAN HOLD THEIR OWN

Fathom also has ambitious plans for promoting the film. Activity will include significant interactive elements both online and off. The current *Delgo* Web site is impressive for an in-production film, so it's not unreasonable to expect it to be beefed up for the actual release. For the moment, however, Marc is keeping his cards close to his chest. "I don't wanna let the cat out of the bag," he laughs. "But we certainly are going for all media forms. We're actually already working on the DVD version, even though the film's not finished yet! We come from an interactive mindset, so we certainly understand the technology, and how it should be applied to the best effect."

It's clear that *Delgo* has the potential to be a truly groundbreaking movie, proving that independent studios can hold their own with the Hollywood giants. If it succeeds, expect more to follow – not least from Fathom itself, which hopes to hook up with a distributor to produce a slew of films. *Delgo* is a real labour of love for Fathom. "When you think back to when we first had the idea," says Jason, "we did a lot of talking, going back and forth over whether we could do it, and finally realising that we could. And y'know what? We're doing it now!"

TOP These monsters are from the Ando clan, one of three main tribes in the film. They are a race of bestial and savage creatures who live on the desolate island of Perran and terrorise the Lockni clan, where Delgo is a member.

ABOVE AND BELOW-RIGHT The production team at Fathom shared their film-making processes with the general public through 'digital dailies' – see the boxout above.

perfect particles

The tools to create realistic smoke, fire and weather can eat up processing power. *combustion 2* rethinks the system and saves on re-rendering

BY MARTIN GISBORNE

All the screen grabs for this feature can be found in the Application folder on the cover CD

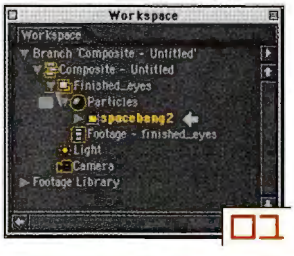
POWER TOOLS *combustion* has powerful layering and nesting. Every element is easily accessed and, with the new schematic layout in *combustion 2*, all can be linked, pre-composited or moved anywhere else. And it has always been a 3D compositor: layers can be made to interact with each other – one layer can cast shadows on other layers. Lights and additional cameras can also be added and animated.

Every 3D application worth its salt has a particle system. Particle systems are used to create smoke, fire, laser flashes, snow, rain and other atmospheric effects. Particles are used to create the realism that occurs in our world and that makes them one of the most important tools in the hammer-belt of the 3D artist. Particle systems are also one of the most resource-hungry parts of any application: during the building of a scene, particles can sometimes be difficult to predict, complex to control and difficult to preview quickly. Later on, when the scene is built, the accurate rendering of the particle effects can be mind-bogglingly slow, even on the most powerful systems.

There is a further drawback to using particles: once they have been rendered into the scene they are there for good – any changes to the particles or the scene itself will require a whole new render. This can cost a ton of time and a bunch of money.

In some situations the particle effect needs to be within the scene because it affects other elements within the scene. But at other times the particles are not being used in three dimensions but are merely being calculated in 3D and displayed on the two-dimensional output of the animation. So why not simply create the particle effects separately?

The latest version of *combustion*, from Discreet, has a significant new feature. That is to say, it has a particle system. This permits the animator to render an animation from a 3D application and then add particle effects at the post-production stage. Any changes to the effect



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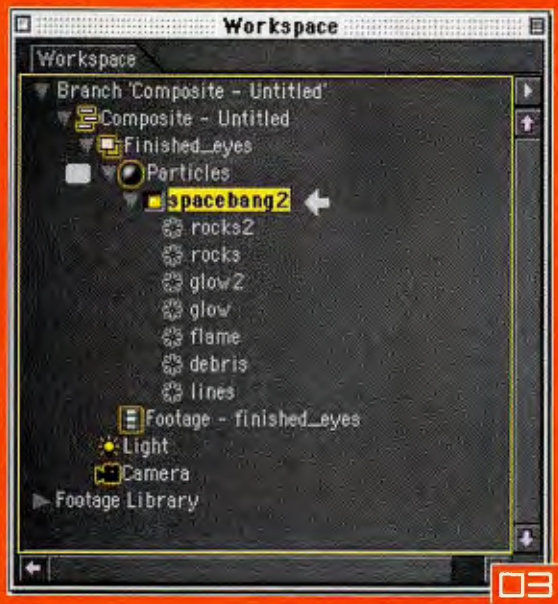

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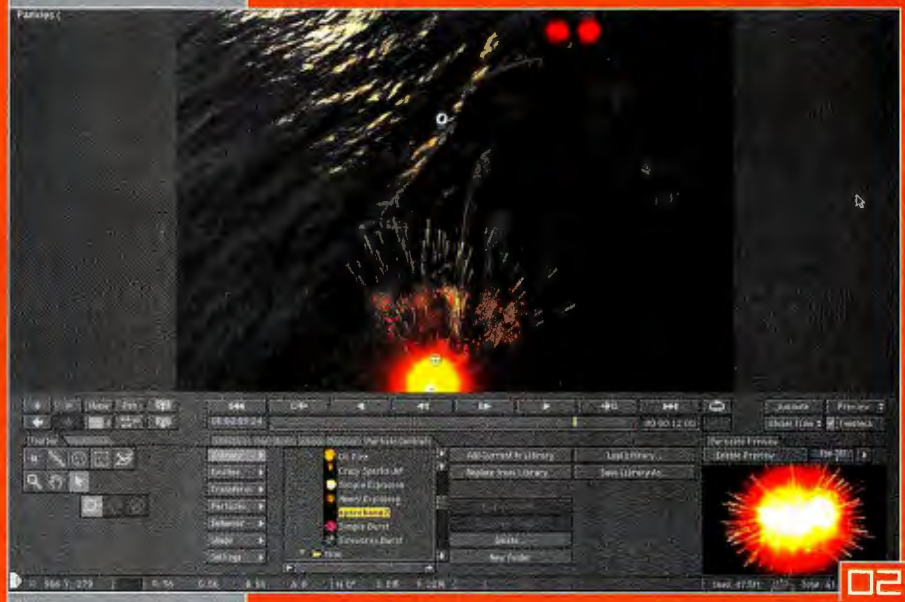
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A PARTICLE IS BORN, IT HAS A LIFE, AND THEN IT DIES – BEHAVING ENTIRELY BY THE RULES YOU SET

THE CONTROLS FOR THE PARTICLE OPERATOR ALLOW HUGE VARIATION, BUT IT'S SIMPLE TO GET STARTED

can be implemented quickly and easily and without the need to render the entire scene over again.

So how does the particle system in *combustion 2* work? It is created, in Discreet jargon, as an 'operator'. It's a separate element that can stand alone on its own layer or be added to a layer (animated or still) within the composition. You can see on the 'workspace' screenshot [01] that in this particular project our composite (the very popular 'Untitled' project) contains a layer called Finished_eyes. In addition this layer has a particle operator called 'spacebang2'.

The controls, parameters and settings for the particle operator allow an incredible amount of variation in the types of effect that can be produced, but getting started is straightforward. Select a particle from the libraries [02]. The preview window shows you how it will look (you can even drag the particle around in the preview to see how it looks in motion). That particle is then placed into the scene and you hit the Play button.

To create unique particles, though, requires an understanding of how the particles work, and to understand that you need to know how they are made in *combustion 2*. Some incredible effects can be achieved by combining particle types into one particle effect. For instance, our main screenshot shows a particle emitting a combination of particle types. In this case 'spacebang2' contains seven separate particle types: two types of rocks, two different glows, a flame, some debris and some general lines [03]

KNOWS WHERE IT IS
combustion's interface is fully context-sensitive, making it a straightforward task to find and change any element in your composite.

PARTICLES

Particles are created from an emitter and then behave entirely according to the rules previously specified for them. You have no control over a particle once it has been emitted. It is born, it has a life and it then dies. Where you can exercise your control is over the particle types.

PARTICLE TYPES

A particle type is the set of rules that you define in the many settings and controls of the particle operator. These rules determine the shape of the particle, its colour or colour gradient, its transparency and a whole bunch of other parameters. The type determines the size, weight, speed and spin properties of the particle. There are many more aspects than this but I think you get the gist.

The first part of the particle type is controlled from the Particles tab in the control panels [04]. This is where the shape, colour and transparency of the particle is defined. The shape of

REMEMBER THAT SCENE IN *THE MUMMY* WHEN BEETLES RAN ALL OVER THE FLOOR?

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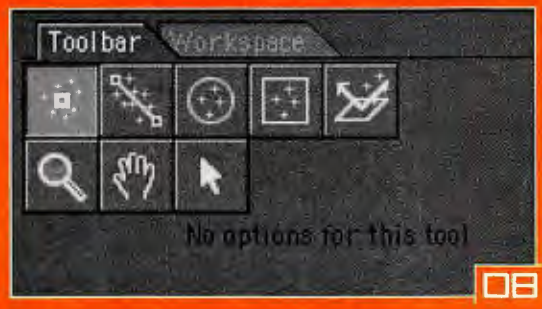

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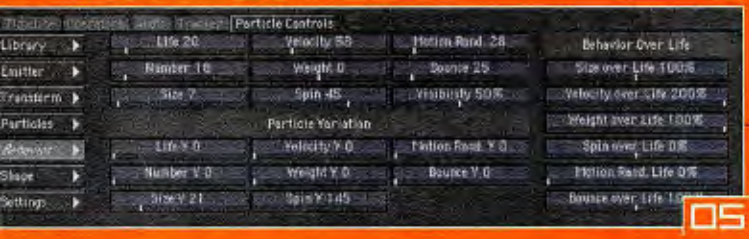

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GRADIENTS CONTROL THE CHANGING COLOUR AND OPACITY OF A PARTICLE – IT CAN START OFF WHITE-HOT AND COOL TO RED AS IT FADES AWAY

the particle can be seen to the left of the window. In this case you can see '1 of 20' shown above the shape – this indicates that 20 different shapes are cycled for this particle.

This control panel has two gradient sections. The first gradient defines the changing colour of the particle. Additional tabs can be added to send the particle through wildly different colours during its life – in the example here, the particle starts out white-hot and slowly cools to a deep red by the end of its cycle. The second gradient indicates a particle's opacity through its life cycle. In this case the particle will fade away as it cools to red and eventually disappear altogether.

The organic, random nature of particles is controlled by the Behaviour control panel [05]. At this point general patterns of speed, spin and motion randomness are set. You can add further variations to these properties, to enhance natural-looking movement (or, conversely, to allow very linear particles if that's the look you're after).

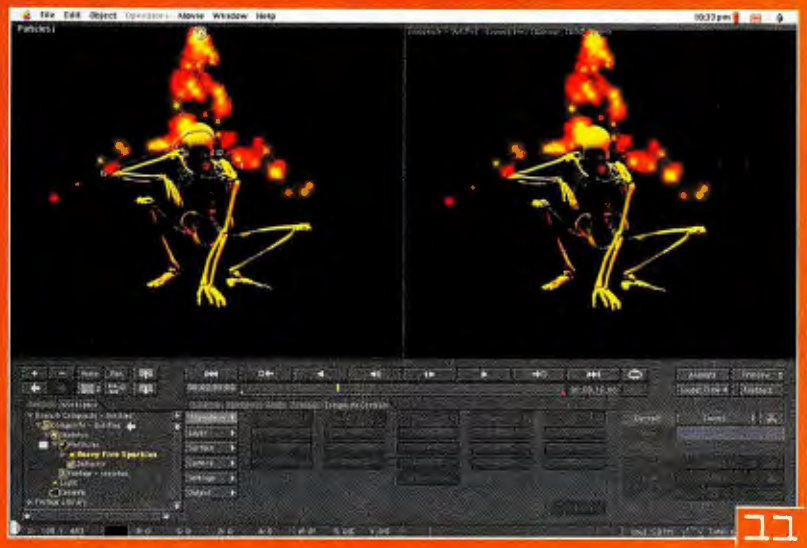
It may be that the particle shape you have selected is not quite right for the effect you are trying to achieve. The Shape tab in the control panels lets you manage different shapes and incorporate them into your particle type [06].

Finally, on the Settings control panel you can add in an amount of general control over the particles. Here you can create motion blur for the particles, further enhancing its integration into a particular scene [07].

THE EMITTER

The emitter is similar to a particle emitter in a 3D app except that it doesn't work in 3D. It is an invisible object that emits the particles that you have created or selected. There are four types of emitters in *combustion 2*: point, line, circle (which can be elliptical) and area [08].

The emitter has its own control panel. Here you can control various elements of the emitter itself [09]. Once an emitter is selected in the workspace, it can be tweaked and controlled at will. Elements such as preload can be controlled – some particle effects have a natural cycle and sometimes you need the effect to



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SPARKS CAN BOUNCE, SMOKE FLOW AND PARTICLES STOP WHEN THEY HIT AN OBJECT

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be in 'full flow' immediately. The emitter has many controls such as its angle of range (from narrow jet to widely spread), its angle of emission, its size and so on.

The emitter, unlike the particles themselves, can be animated within the scene. The Transform control panel allows the position of the emitter to be keyframed [10].

PARTICULARLY GOOD
combustion's particle effects are incredibly versatile and controllable, allowing masses of different effects to be created. In addition, deflectors allow powerful directional control.

DEFLECTORS

In a regular 3D app we can use collision detection to channel the flow of particles around an object. This way we can make sparks bounce off things, smoke flow around objects and particles stop when they collide with other objects in the scene. This effect can be achieved in 2D in *combustion 2* by using Deflectors. The Deflector object can be found on the particles toolbar next to the different emitter types. Deflectors can be as simple as a straight line or a more complex line [11]. Deflectors can also have a thickness – meaning that particles can be deflected gradually: some pass through the first part of the deflector only to be deflected further along.

FINALLY

Once you have explored the particles within the libraries and played with the various controls it is time to start exploring with your own particle effects. Shapes can be created in another application (for instance *Photoshop*) and imported into *combustion 2* and used on a particle type. It is also possible to use frames of an animation as a shape. Remember that scene in *The Mummy* when beetles ran all over the floor? Better start modelling a simple beetle walk cycle.

Moving even further ahead, *combustion*'s motion-tracker is borrowed directly from Discreet's high-end systems. With the tracker you can track an object's movement through a scene and directly attach a particle emitter to the path – this means keyframing of the emitter is not always necessary. This is a great timesaver when you need to attach a smoke trail to, say, an animated craft [12].

Particle effects in any application are addictive, and *combustion 2* is no exception. The more you explore and understand the elements that create the particle types, the more complex and unusual your effects will become.

Martin Gisborne works across 3D, video and print. He knows a bit about a lot of applications and absolutely everything about *Sherlock*. Email him at **martin@ideaslinger.com**, which one day will also be a Web site.

BOARD ROOM
The tale of a child on a spiritual journey was fleshed out in a number of brainstorming sessions and then storyboarded down to the last detail.
"We tried to do it blind at first, but it was impossible."

treehousepictures
little red plane

Teamwork, dedication and a passion for storytelling has driven a group of LA students to succeed. We want a ticket to their Oscar celebration. **BY SUSAN WRIGHT**

Wira Winata is on a high right now. No need for fancy chemicals – just a shot of bringing a dream to life does the trick. "We are in the best times right now," Wira enthuses. "We're finishing *Little Red Plane* and watching it finally come to life, and we're starting a new project and seeing it grow in front of our eyes."

Little Red Plane is an eight-minute animated short about a five-year-old boy whose imagination takes him on a spiritual journey with his little red plane. "We" is the team of 11 that has been pumping the oxygen into *LRP*. Cajoled into existence by Indonesian-born Wira and his partner in big-ambition madness, Joey Jones, the group is a colourful assortment of international design students and recent graduates based in Pasadena, Los Angeles. They have rather insanely

THE BEST ADVICE THEY RECEIVED: "COLLABORATE!" THEY DEDICATED THEMSELVES TO THIS PROJECT FOR OVER A YEAR ... AND THEY STILL TALK TO EACH OTHER

dedicated all their spare time for the past year and a half to working on *LRP*. And it's been worth every missed beer.

"The most satisfying thing about creating *Little Red Plane* has been watching the group prove to itself that we can dedicate ourselves to a project for over a year," says Wira. "And," he adds somewhat mischievously, "we're even still talking to each other."

It's been a crazy ascent up a steep learning curve for the team. And they've reached the end clutching a piece of advice that overwhelms all others. "Collaborate!" Wira offers immediately. "We discovered how working together only strengthens the project. The opportunity to learn from others better than you is valuable. Also, when you work with others, you learn when to accept constructive criticism and when to debate your convictions."

FACTFILE

FORMED 2000

EMPLOYEES 11 students

BASE Pasadena, California

WEB www.littleredplane.com

CONTACT littleredplane@shadedbox.com

CREDITS *Little Red Plane*, an 8-minute animated short

You also need to pack a big bundle of passion for the journey. It's a cliché but no one thought *LRP* would take so long. What started out as a class project for Wira and Joey at the College of Art and Design in Pasadena turned rapidly into a full-blown production when word-of-mouth started to spread with all the furious enthusiasm of a 1977 *Star Wars* release. Everyone wanted to be involved and they soon had to whittle down the numbers.

Like many budding animators, the *LRP* team had Pixar firmly in its sights. "Pixar, without a doubt, has been the main inspiration for our coming together," admits Wira. "The first time I saw *Geri's Game* I said to myself, 'That is what I want to do.' Their way of telling stories through believable animation, and not just showing off the latest technology, has been our inspiration."

But, while holding dear the value of good storytelling, the *LRP* team was adamant that the look of *LRP* should be different from the *Toy Story* look. "We were trying to give our animation a different flavour. We didn't want a super-realistic look but something more stylised." Hence the lush, artistic, broad-brushed look of *Little Red Plane*. The look was a conscious attempt to blur the difference between computer graphics and traditional painting, and emerged primarily

from the paintbrush of *LRP*'s Jason Du, a Taiwanese illustration student trained in background painting.

All the 3D modelling and rendering for *LRP* was completed in Alias|Wavefront's *Maya* – from the earliest animatics through to the finished version of the kid, Mikey. *Maya* was their tool of choice and it helped them address one of their biggest problems: sorting out an efficient pipeline.

"*Maya*'s referencing capabilities means that one person can be finishing the modelling, while another person is animating it, and another is adding shade and texture," points out Wira. And everyone loved it. "Our animators, lighting crew, modellers, and shaders all feel *Maya* was designed for them. That says a lot."

But *Maya* does have its limitations. Take clouds, for example. The results from *Maya* just weren't convincing. "They looked too round," says Wira, "and out of place." But one of the advantages of studying close to Hollywood is having top-of-the-ladder guest speakers divulge tricks of the trade in guest seminars. The Pixar gods themselves had taught Wira not to rely on *Maya* completely. So, using Adobe's *AfterEffects*, they used compositing and multi-layering techniques to create the clouds instead of opting for a rendering.

Once they'd discovered the beauty and power of *After Effects*, the *LRP* group used it to fill in all sorts of holes that *Maya* couldn't fill – to add depth to the lighting, adjust colour and create particle effects such as water splashes and explosions. "We were so surprised what you can pull off in *After Effects*," says Wira.

LRP should find success on the festival circuit next year. In the meantime, the experience has proved addictive. "We intend to start an animation house," gushes Wira. "We want to inspire a new generation of animated projects." The vision is grand but his excitement is infectious. He's so sincere, so down to earth, so genuinely in love with the medium that we believe he and his team might just do it.

"Five years from now I see myself reading *3D World*," dreams Wira, "where we land the front cover because we have just accepted the Academy Award for an animated film." He finishes with a big smile. "We're keeping our fingers crossed right now."

So are we. And we want an invite from the Treehouse Pictures crew to their Oscars party when it happens.

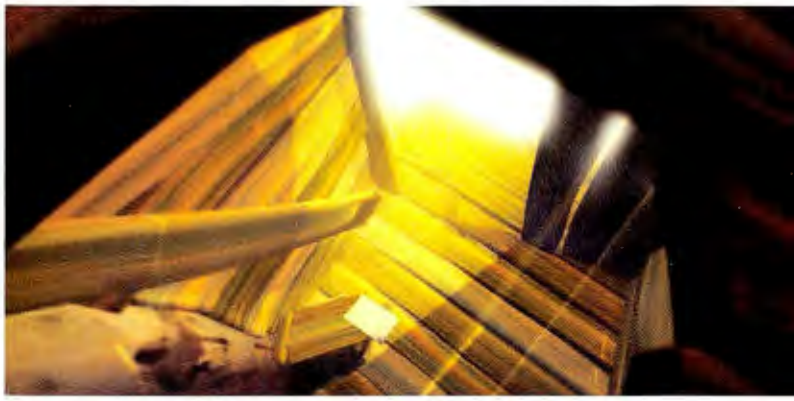
TRADE SECRETS

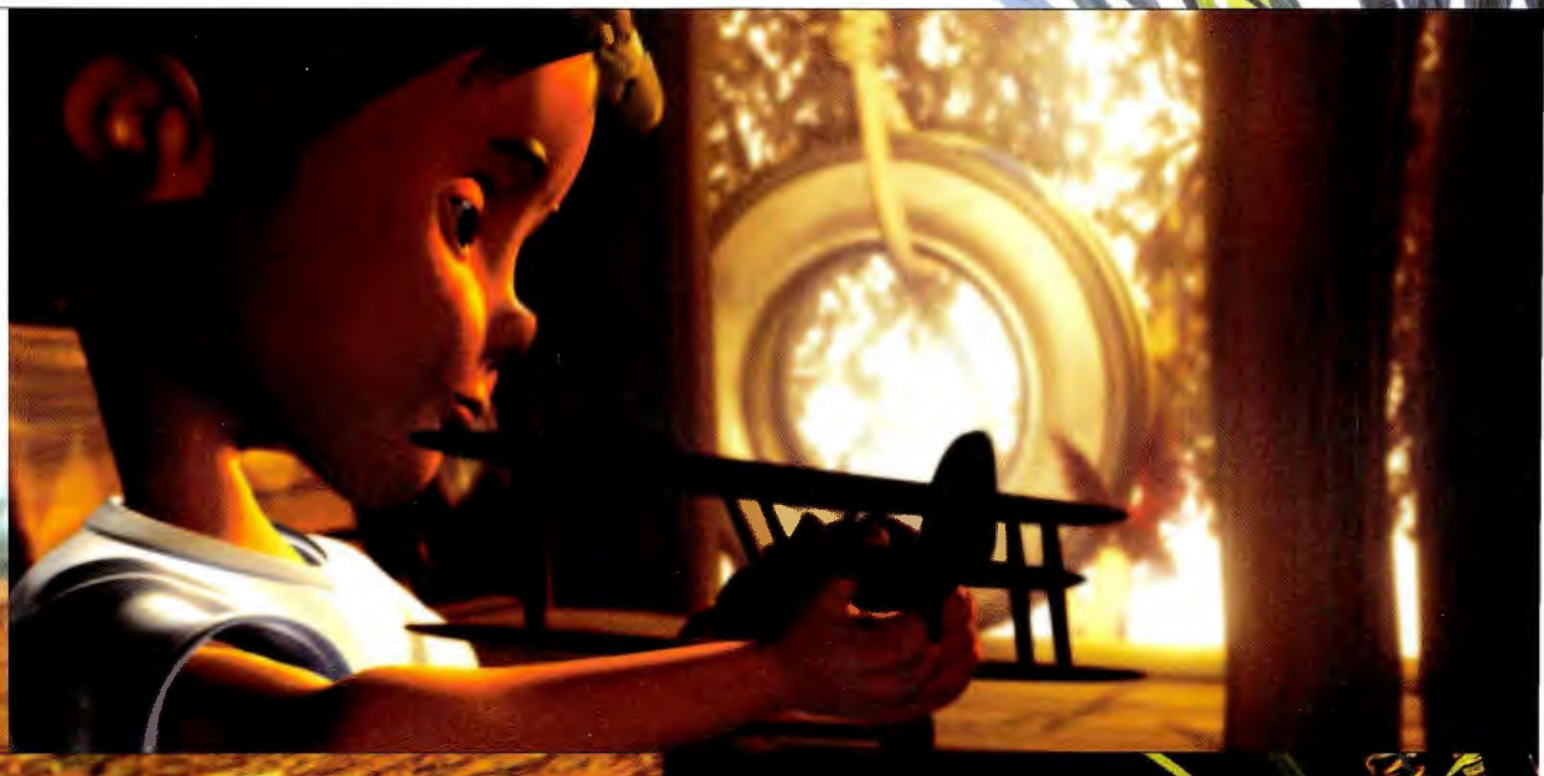
The Little Red Plane **team had the help and support of their well-qualified teachers in Pasadena. One of them had at one time – rather usefully – been a background painter for Disney. He revealed a few composition tricks that Walt uses to lure the viewer's eye into concentrating on one area of the picture. Another had been a modeller on the Disney animation, *Dinosaur*.**

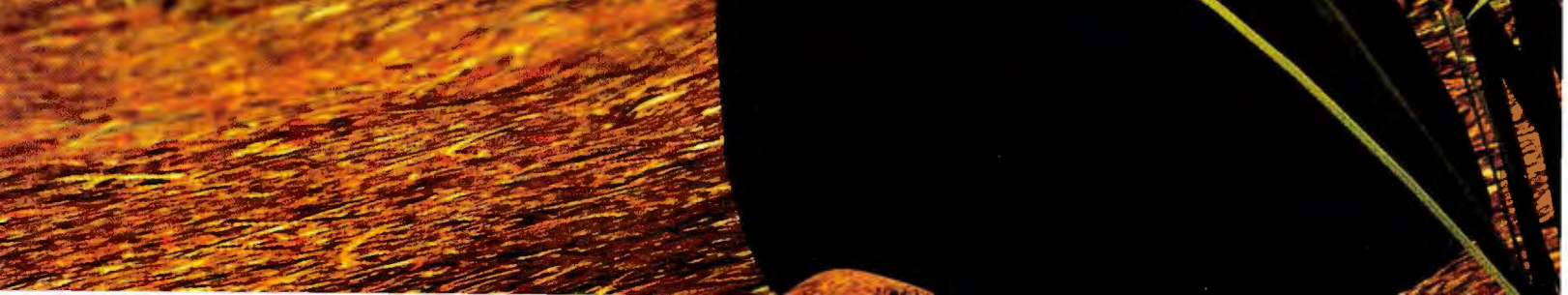
THEY USED THE BEAUTY AND POWER OF *AFTER EFFECTS* TO FILL IN HOLES THAT *MAYA* COULDN'T MANAGE

PAIN AND GAIN

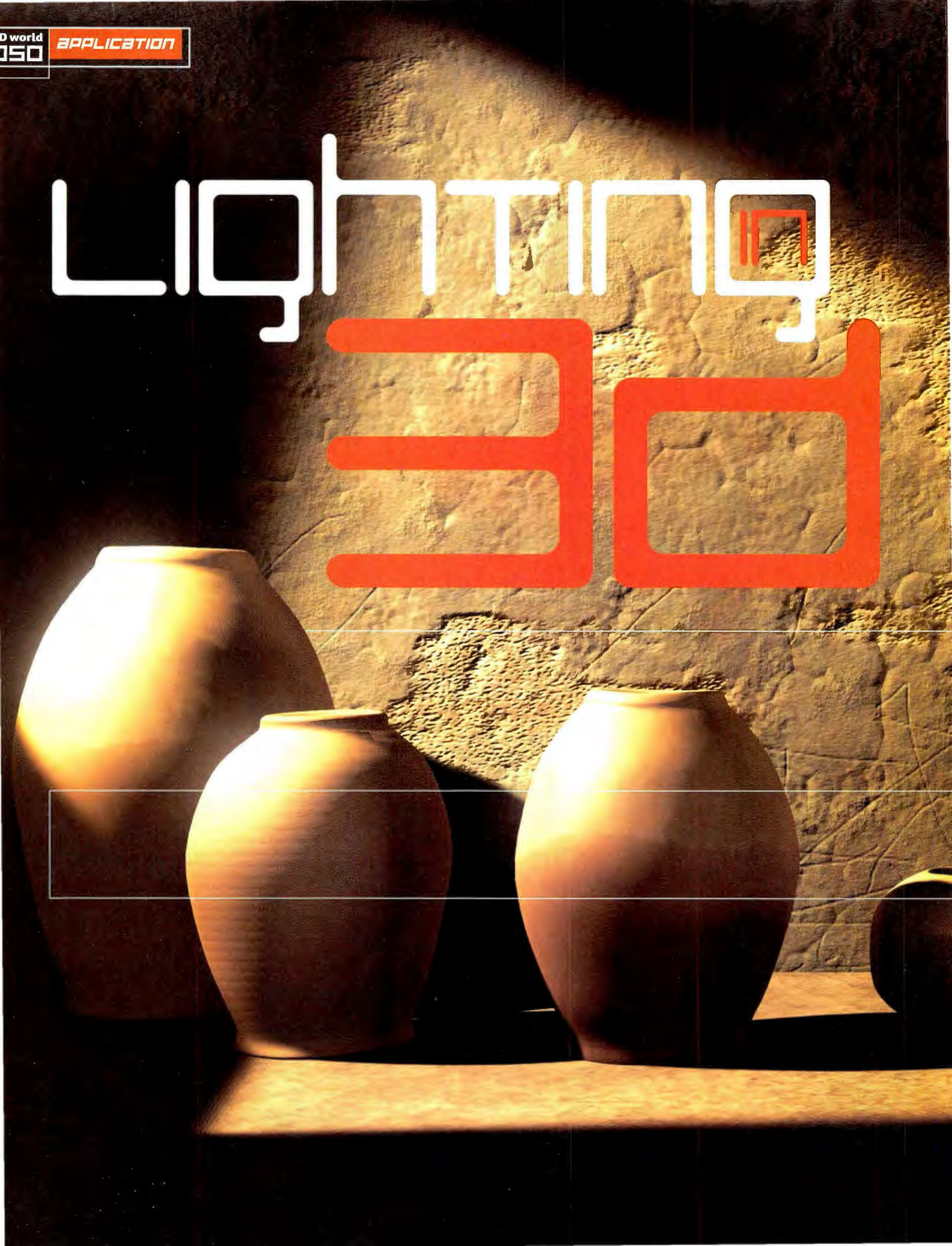
Little Red Plane was hard work, but worth every bead of sweat. Now the team is feeding on the energy of reward. "We taught ourselves how to tell a narrative visually. We read books, asked instructors, and just did it. We now look at our first animatic and laugh at how far we've come in a year."







Lighting 3D



Come in out of the dark – with style. The tried-and-true crafts of lighting carry over from the worlds of theatre and film into computer-generated graphics. Here's an art-college theory lesson: key light, fill light, radiosity, classic rigs ... BY SIMON DAHAHER

ON THE CD

Make This Pic This Texture can be found on the cover CD

Lighting is one of the key ingredients for making your 3D image or animation look incredible instead of indecipherable. You can have great models, superb textures and flawless animation, but with a duff lighting setup you sell your work short.

Creating superb lighting is actually pretty simple once you get to grips with the basics, and that's what this article is all about. The handy thing is that lighting techniques learned by craftsmen over the years in theatres and in films is directly applicable in 3D graphics apps. It's worth searching out books on theatrical and cinematic lighting for this reason.

Where many budding John Knolls go wrong is to sling up some lights without any sense beforehand of how they want the lighting to look. If you know some basic lighting techniques you'll have a solid base from which to work when lighting your own scenes. This will empower you to achieve the look you want without too much fuss.

FORM

The most fundamental quality of light is its ability to give *form* to objects. Without light your scene is black and objects are formless. This may seem very obvious but it is important. If you begin to think about *revealing* your object rather than simply making it visible you'll realise that darkness is just as important as light. The degree to which you reveal an object's form has two consequences: *readability* and *visual interest*.

Consider the vase below, lit in two different ways. If a shape has an indistinct profile and it is lit with a single shadow-casting light [01], both its form and the spatial relationships in the scene are poorly described and the image is dull. Change the angle of the light [02] and the form and position of the objects in the scene are revealed.

Readability is very important, and this is what good lighting provides. All readability really means is that the relationships between objects in the scene (and also their reason for being there) can be 'read' by the viewer quickly and easily.

You may think that in animation the role that lighting plays in this respect is not so important because the motion of objects or the camera gives you extra visual clues (parallax, for example). This may be true, but poor readability can cause editing problems if a shot is not clear. You may have to hold on it for longer, spoiling the pace of the animation. With still images, viewers can stare for as long as they like. This is not the case with animation, so it must be immediately clear what, where and why the objects are. So lighting is crucial.

The rocking-horse scenes also illustrate this. Again, a scene is lit with a single light placed at the location of the camera. More or less every portion of the object that the camera sees is fully illuminated. The resulting image [03] is flat and lifeless. However, because the object has a distinctive shape, its form is clear against the black backdrop. It's obvious what the object is, but it's not very interesting. Let's try the light at various angles – [07] is an overhead view of the lighting setup.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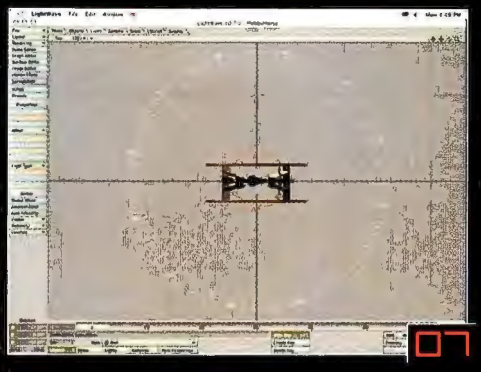
When the light is placed directly behind the object [04], plunging it into darkness, very little information is available for our brain to discern it. As the light moves from its 180° angle, through 120°, 90°, 45° and 20° to the camera, the object's form is gradually revealed [05][06][08][09]. Notice that to our eyes – and brains – the image is most intriguing when much of the object is still in darkness. Our brain has to work harder, processing the information in the image to match what it's seeing to a mental reference, and recognising it. As the object becomes fully illuminated again, our brain needs to work less hard and the image becomes less of a puzzle.

So the first important lesson to learn is that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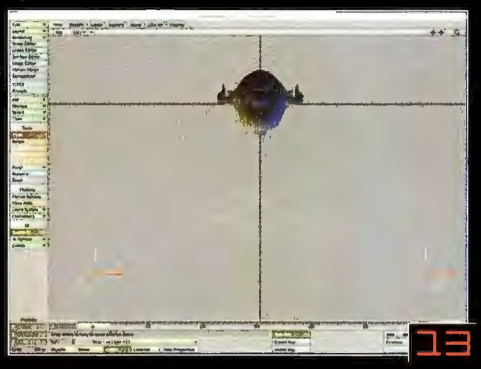
Two considerations to balance in every shot:
- **Think about *revealing* your object rather than just making it visible.**
- **In animation, *readability* is even more important than in stills – you don't want to spoil the pace.**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you don't have to fully illuminate an object for it be readable. Treating an object's form so discreetly as this may not seem directly applicable, but it's important to see that all the elements in a scene can be treated as both literal objects and graphic elements whose representation can be manipulated using careful lighting. Balancing readability and visual interest is important and you should consider these two points when composing each shot in an animation or a still image.

USE A TRICK FROM THE THEATRE: MAKE A FULLY LIT FOREGROUND YET STAND OUT FROM ITS BACKGROUND

SCENE COMPOSITION AND LIGHTING

Almost always a rendered image or sequence has a foreground element (which is usually the subject of the render) and a background. Lighting plays a crucial role in providing the correct balance between the foreground and background.

The problem, as we have seen, is that by fully illuminating an object it can look flat and uninteresting. Using a trick from theatre lighting, you can illuminate an object fully while maintaining some of the contrast of partial illumination.

With the face-on lighting [10][11], a character appears fully illuminated but the image is also flat and lifeless. There is little depth and the object does not stand out well from the background.

What we can do is use two lights – one with a warm colour, the other with a cool colour – and set them on either side of the object and at a lower intensity [12][13]. By using colour, essentially you are simulating the effect of one side of the object being in shadow. The cooler blue light provides the contrast to the warmer light, despite both illuminating the object evenly. The result is that the image is more interesting. It can be a useful trick if you need to have an object fully illuminated without sacrificing too much interest or contrast.

By adding two lights and changing their colour we have made one light seem more important than the other. Despite the two lights being the same intensity it seems that the warmer light is in some sense stronger than the blue one. One light becomes a *key* light and the other takes on a supporting role. In the above render, both lights are casting shadows, resulting in a messy confused look.

The brain wants the warm light to be the dominant light, but the double shadows are causing tension in the image. By turning off the blue light's shadow [14], the role of each light becomes much clearer and the image looks more natural.

The converse situation occurs when you want your object not to be fully lit but to appear as a silhouette. This can be achieved by placing the key light behind the object and somewhat above or below it. Another light is used, set to a low intensity, to fill in the shadow portions of the object that are unseen by the key light. Using two lights like this – one as a key

the other as a *fill* – provides the basis for the simplest lighting setup, the *two-light rig*.

RULES OF THUMB

Key and fill lighting provide you with the core ammunition you can use to light a scene. Here are some basic rules of thumb.

Most 3D programs have *ambient* lighting, which provides omnidirectional illumination throughout a scene, lightening all surfaces. This may sound like what you'd want from a fill light, which is to lighten the shadow areas. But using ambient light for this purpose tends to reduce the dynamic range of an image. To use a *Photoshop* analogy, it is like applying Levels and increasing the Black output slider so that the darkest pixel is no longer fully black.

99% of the time, use a real light as a fill. This way you maintain information levels in the image in two ways. First you keep the dynamic range intact, and second you add direction information to the scene because the fill light will cast light directionally (as opposed to omnidirectionally like ambient illumination). This gives your images a much better look and you more artistic control.

There are a few general rules of thumb that you can learn for positioning lights in a two-light rig.

The key light can be placed at 45° to the side and 45° above the camera if the subject is facing us, so that part of the object is in shadow [15][16][17]. The fill is set to a much lower intensity than the key and can be placed on the opposite side of the object – 90 to 120° is a good starting point – and also much lower than the key light. This creates a simple and pleasing

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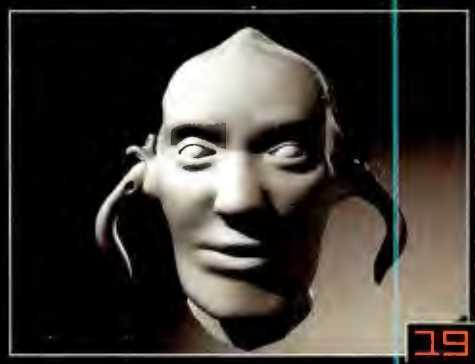

19

KEY AND FILL LIGHTING GIVE YOU THE MAIN INGREDIENTS FOR MAKING A SCENE SHINE; CLASSIC THREE-LIGHT RIG ADDS *BACKLIGHT*

illumination of the object. The fill can be moved more forward or rearward, depending on the degree of lightening and contrast you want.

The key doesn't always have to be in this position, as we'll see, but keeping in mind this relationship between the key and fill will be helpful.

You can create different moods by varying the angle of the key light. Putting the key below a character's face creates a spooky, menacing look [18]. Lighting directly above casts eyes into shadow, adding a sense of mystery to a character. Using opposing colours works well in these situations too.

Fills can be used to simulate *radiosity*, the effects of bounced light. Place an object near a wall, shine a light on the wall, and it will reflect some of that light back onto the object. Placing a fill behind the wall can achieve this effect (you'll need to disable shadows for the light, and if the wall has a colour make the light the same tint).

THE THREE-LIGHT RIG

The three-light setup adds a third light to the rig and is the basis for many studio photography shots. The three-light rig adds a *backlight* to the two-light setup. In the real world a backlight tends to catch tiny surface details such as hairs and fluff on clothing which outline the objects or persons being photographed, making them stand out from a background, especially in black-and-white photography.

In 3D this technique can also be applied, but because surfaces are smooth a backlight doesn't always have the same results as its real-world counterpart. You tend to have to move the backlight more to one side or more above or below to get the edges of the object to be illuminated. You can also pump up the brightness of the backlight too.

As you can see [13], adding the backlight (another spotlight) adds a bright edge to the object, which gives it some snap and really helps to pull the object from the background, especially since they are the same neutral gray.

Because in 3D there are usually no surface details to catch backlighting, it may be necessary to use and array two or more backlights. Alternatively, using a large area light placed directly behind can produce more of the light 'creep' that we are after – though area lights tend to take longer to render and can suffer from shading noise. The other alternative is to add some 3D fur geometry or use material translucency to get some backlighting effects. This can make skin look particularly realistic.

LIGHT FALLOFF

Real lights don't illuminate evenly over distance. Their brightness falls away as you get further from the light source. It's easy to visualise why this happens if you imagine light as an expanding sphere. The surface of the sphere contains only a finite amount of energy, which is being spread thinner and thinner over the surface as the sphere expands. The mathematical formula for the surface area of a sphere is $4\pi r^2$, so doubling the radius r makes the surface four times as large, trebling it makes nine times as much surface to illuminate with the same light energy, and so on. To calculate how much energy reaches any point on the surface you have to divide by the square of the radius: the *inverse-square* law.

3D lights do not by nature have this limitation, but most 3D software has a *falloff* control that can be activated for point, spot, area and linear lights. (Directional or distant lights usually do not have falloff.) Enabling it adds a great degree of extra control and realism to a scene.

With no falloff [20], an image can look OK but still a little lifeless. Notice that the shading around


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the pot is pretty uniform and the backdrop, which is further away from us, is at a similar brightness. Adding falloff to both lights [21] produces a much more interesting and believable render. The diffuse shading has more punch and variety, showing the object's form better. There is also a greater sense of depth.

Within the falloff control, you may also have further options to change the rate at which falloff occurs. Natural falloff obeys the inverse-square law (it may be called Inverse Distance^2, or something similar, or you may be able to enter a number as an exponent). Generally, you use this option for photorealism.

If you want to intensify the lighting on the foreground object but not affect the background [21] this is what you do: Add falloff for your lights, setting the falloff distance or range so that the background receives the same amount of light as before. Then move the lights closer to the foreground object (or increase their intensity).

By adjusting the falloff and intensity as well as the relative brightness of the key and fill lights you have complete control over the relative illumination of foreground and background and overall contrast. A high-contrast light setup where the key light is highly dominant would be useful for environments where there is strong direct illumination, such as outside on a bright summer day, or for a character performing on a stage. Low-contrast setups using multiple fill and backlights result in softer and subtler images that resemble radiosity renders.

KEEP IT SIMPLE

With more complex scenes, lighting can be tricky since you may often feel the need to add many more lights. Breaking things down and keeping it simple is often the best approach. Fewer lights makes the lighting process simpler and also much easier to troubleshoot. Consider moving or modifying the existing lights before adding more. If you break things down to the core elements of subject and background, and light these simply using key and fill techniques you have a good base point for creating better-looking scenes.

> WHEN YOU CAN LIGHT AN OBJECT PROPERLY WITH THREE LIGHTS, THEN YOU CAN EXPERIMENT WITH YOUR PROGRAM'S TRICKS

As with all things in 3D you get better only with practice. So with some of these techniques and considerations in mind, spend some time testing out various lighting setups on simple scenes, breaking things down visually. If you can light an object perfectly with three lights you can then begin experimenting with all the options your 3D program has to offer. Your 3D work will only improve as a result.

Simon Dahaher has worked in 2D and 3D graphics for more than five years, developing an insatiable appetite for strong coffee and Thai food. He wrote *Digital 3D Design*, now out from Cassells (UK) and Watson-Guptill (USA).

redwinganimation

How do you produce 40 episodes of a kids' programme in 18 months when you have no prior TV experience? You bluff it...

BY RICHARD LONGHURST

ABOVE *Star Maths* is a kids' educational series featuring a regular cast and a planet called Junkiter.

TOP MIDDLE (right page) Uncle Zac is the kindly know-it-all who dispenses knowledge.

BOTTOM MIDDLE (right page) Amber grapples with a maths problem and hopefully teaches the viewers a thing or two at the same time.

The best thing about going to school in the UK wasn't having a fumble behind the bike sheds or getting ice cream once a term for school lunch. It was watching telly in the library and pretending to shoot the dots as the naff on-screen clock counted down to the start of *Programmes for Schools and Colleges*.

By contrast, today's lucky nine-year-olds get an embarrassment of educational riches in the form of *Star Maths*, a *Maya*-produced 3D series from Redwing Animation.

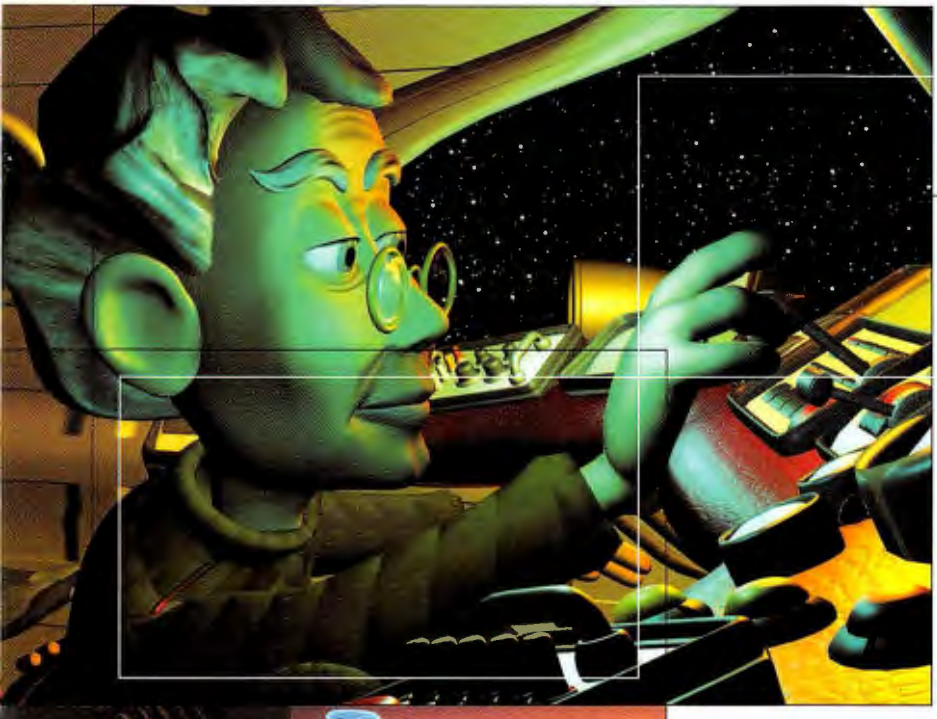
Redwing started life as a design studio called PC+ in 1981. Early projects consisted largely of *Photoshop* work for advertising agencies, followed by short-form animation work for BBC, Channel 4 and the Discovery Channel in the 1990s.

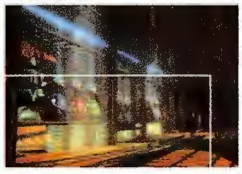
It's only in the last couple of years that the 3D animation business has kicked off for Redwing. A chance meeting in 2000 with a TV production company, Flying Pictures, resulted in a commission to produce 40 episodes of an animated children's maths programme.

"We were doing 3D fly-throughs for companies selling fancy London flats, and a guy from Flying Pictures was in our studio one day and happened to ask us if we knew anyone that could do 3D animation for TV," Redwing's Ammar Moussa remembers. "We said we could, ever though we didn't have hands-on experience of working for TV production."

The bluff worked, and three months of pre-production resulted in the concept of a planet called Junkiter where Uncle Zac lives with his recycling Wattbots. Two kids, Sam and Amber, arrive by spaceship for the summer and much mathematical mayhem ensues.

"We were just given the concept 'kids on a strange planet'. We devised a format, invented characters, designed sets and story outlines, and wrote the animation bible and sample scripts. Then





BY THE END OF THE PRODUCTION CYCLE, THE COMPANY WAS CRANKING OUT ONE 5.45-MINUTE EPISODE EVERY TWO WEEKS

TOP RIGHT The series is aimed at 7-10 year olds and has been warmly received by teachers and children alike.

RIGHT The series is modelled and animated in Maya, though the characters were initially modelled in clay.

we bought a *Maya* suite with nine seats and got animating." The characters were first modelled in Plasticine and then built and boned up in *Maya*. "The quality jumped from episode one to the end of the series," says Moussa. "The walk cycle, the texturing, the detailing on the models and the sets just got better and better."

Producing 40 episodes in 18 months was a tall order for a company that hadn't done TV work before. By the end of the production cycle this summer, the company was cranking out one 5.45-minute episode every two weeks. Organisation and control were key to the project's success.

"The budget and timeline were so tight that our production pipeline had to be completely streamlined," says Moussa. "We have a thorough spreadsheet system where we outline every shot, who's doing it and when it has to be done by. We have constant communication and a very tight schedule."

Despite the educational content's lack of obvious charisma, it was no problem to attract animators to the project. Eight animators were recruited to work with creative director Paul Clowney and technical director Clwyd Edwards. "They're bored of blowing things up in Soho," Moussa says. "It's nice for them to do a bit of friendly character animation and it's good for their CVs, too."

Now that the project has drawn to a close (although the last episode of *Star Maths* doesn't air till March next year), Redwing is paying the bills by working for Chorion, the intellectual-property company that owns the rights to everything by Enid Blyton, the prolific children's author. The company has produced a new *Maya*-animated series of her best-known character, Noddy, from which Redwing is rendering stills. "They need a load of images to be rendered out for books and publishing material that goes with the series. We code the characters and render out the images – and hey presto, you've got yourself a book."

Star Maths was well received by teachers, children and Flying Pictures – "They were expecting stick figures and we've given them an entire universe," enthuses Moussa – but because the rights are owned by Channel 4 and Zurich Insurance, the sponsor of the programme, it was only a moderate financial success for Redwing.

"It would be perfect to own the rights to a series," Moussa says. "What we really want to do is use the technology to develop 3D concepts for children's TV. We can do the whole shebang – we just need to find someone that needs a TV programme to be made."

FACTFILE

FORMED 1981 as PC+

EMPLOYEES 11

BASE West London, UK

WEB www.redwinganimation.com

CONTACT +44 (0)20 8991 0029

CREDITS *Star Maths* is the company's first venture into TV production under the name Redwing Animation

wirefusion2

The full version of *WireFusion 2.0*, the 3D Web authoring package, is yours free on the disc – along with a demo of version 2.1. Learn how to create an interactive lottery ticket

BY SET LONNERT

All the images for this tutorial can be found on the cover CD

Today there are alternatives beyond *Flash*, *Director* or *LiveMotion* when it comes to producing interactive 2D material for the Web, and for photorealistic 3D presentations the scope is wider than *Viewpoint* or *Cult3D*. Common for most 2D and 3D technologies on the Web today is that the user has to download and install (or upgrade) a browser plug-in in order to view the presentations.

The Swedish software company Demicron, however, uses Java techniques in its authoring tool *WireFusion* to present both 2D and 3D, and thus avoids the plug-in problem. *WireFusion*'s complete 3D engine is squeezed into just 31K – impressively small compared to a typical plug-in that can take up 300 to 1500K of disk space, RAM space and load time.

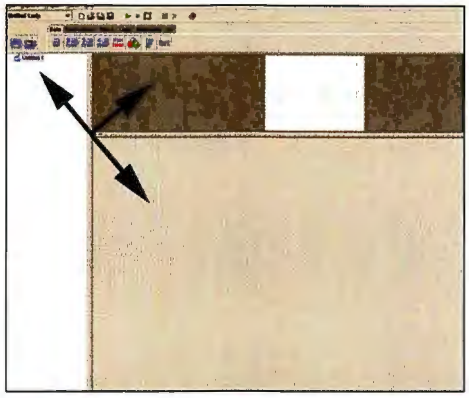
A new feature in *WireFusion 2.1* is the capability to add animations and interactivity to your 3D model textures on the Web. The goal of this tutorial is to design an interactive lottery ticket in 2D, which then will be applied as the texture on a 3D lottery ticket.

Set Lonnert produces articles, books, educational materials and lectures in the ancient Swedish university town, Uppsala. He's a Java expert and likes clean code.

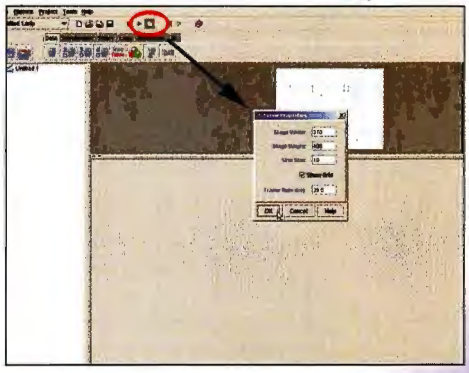
step one it could be you...

Much of the trick with *WireFusion* is learning how to connect inputs and outputs

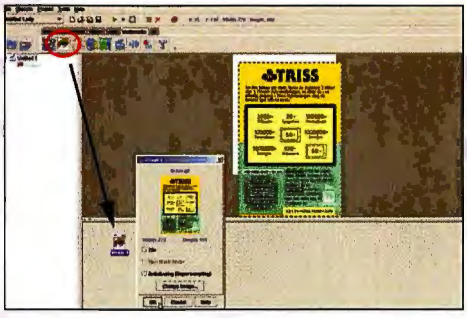
1 Install the *WireFusion 2.1* tryout software from the cover CD. Copy the WireFusion_Lottery folder from the CD to your computer and ensure you have read/write permission on your files. Open Final_result.html. Use the mouse to scratch the shamrock designs or to rotate, zoom and pan the ticket.



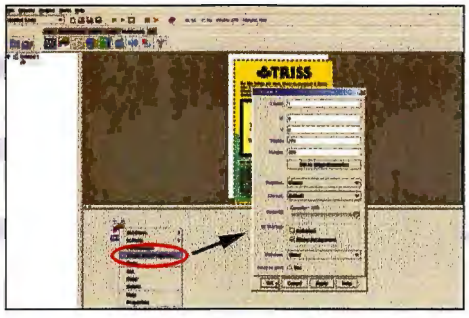
2 Open *WireFusion*. The interface consists of three viewports: Object Explorer, Script Area and Work Area.



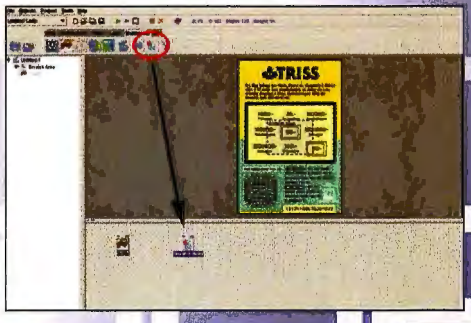
3 In a new and empty project, open the Scene Properties dialogue and set the Stage dimensions: width 270 pixels and height 400 pixels.



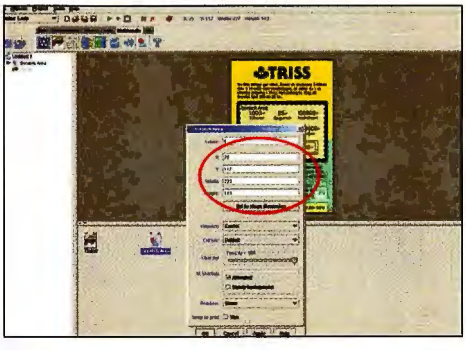
4 Under the Multimedia tab, insert an Image object to the Script Area. Rename the object to Ticket. To load a new image, double-click Ticket > Change image, and load ticket.gif. Properties for each graphics object are set in the Target Area Properties dialogue, which is launched from the Object menu.



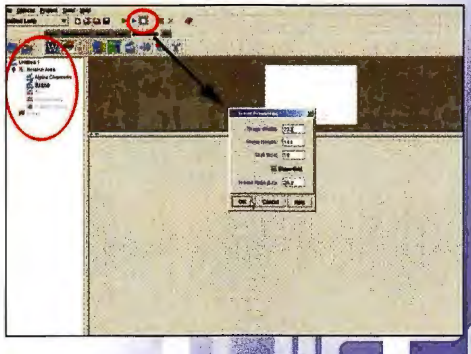
5 Open Ticket > Target Area Properties, click the "Set to stage dimension" button to make the Ticket Target Area stretch over the Stage. Unmark the "Activate" tickbox and mark the "Stamp background" tickbox instead – this will give better performance, as this image will be static.



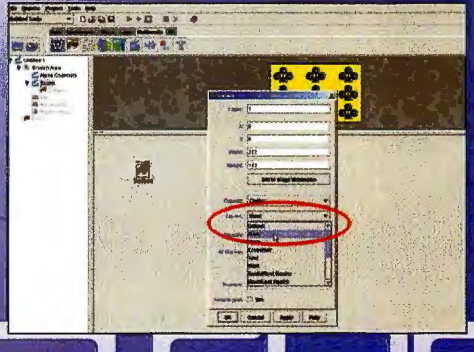
6 We will cover the ticket result with a surface image, but we will not use an Image object for that; we will use a Sub-Scene object instead, because the Sub-Scene has an alpha channel and the Image does not. Insert a Sub-Scene object, also found under the Multimedia tab, and rename it Scratch Area.



7 Go to Scratch Area > Target Area Properties; change its position to x=25 and y=117, and its dimensions to width 222 and height 143. The bluish Sub-Scene Target Area should now cover the Ticket result area.

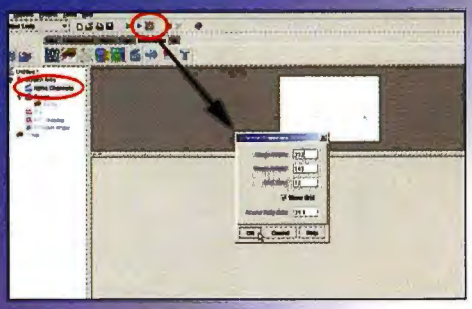


8 In the Object Explorer, select Scratch Area > Scene. You will now see an empty Scene. Change its Stage dimension by clicking the Scene properties button. Change the dimensions to the same as the Scratch area: width 222 and height 143.

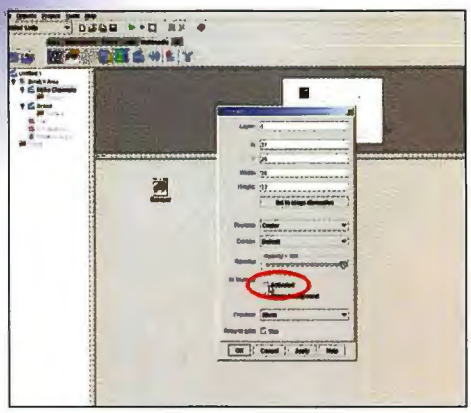


9 Insert an Image object, rename it to Surface and load the image surface.gif. Open Surface > Target Area Properties, click the "Set to stage dimension" button and, from the Cursor menu, select Hand.

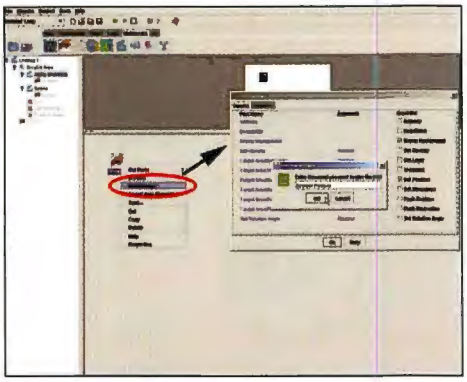
STEP ONE continued...



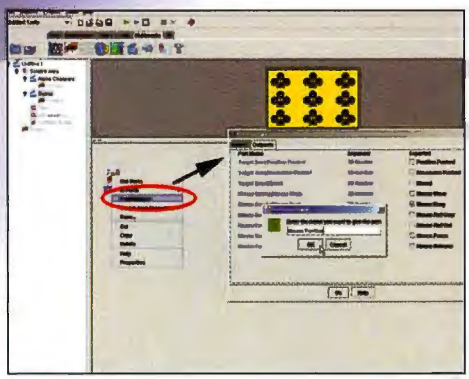
10 To erase the Surface image when we're scratching it, we need to draw or fill the alpha channels with black. Select Object Explorer > Scratch Area > Alpha Channels. You should now see the empty alpha-channel scene. Change its Stage dimension by clicking the Scene properties button. Change it to the same dimensions as the Scratch Area: width 222 and height 143.



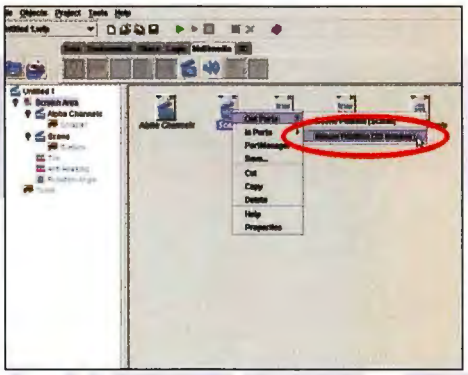
11 Insert an Image object, rename it to Scraper and load the image scraper.gif. Open Scraper > Target Area Properties, unmark the Activate tickbox.



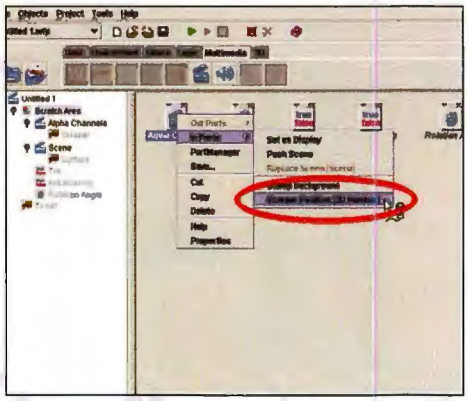
12 Open Scraper > Port Manager. Export two inports (i.e. mark the tickboxes) then Stamp background and Set Position. Rename Target AreaISet Position to Scraper Position before exporting.



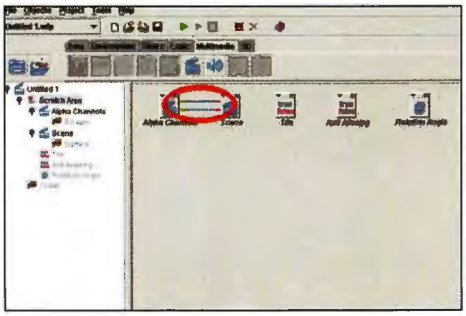
13 In the Object Explorer, select Scratch Area > Scene. Open Surface > Port Manager and export the outport Mouse Orag. Rename "Mouse EventsIMouse Drag" to "Mouse position" before exporting.



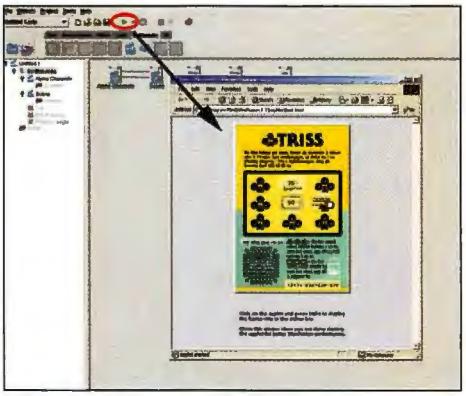
14 In the Object Explorer, select Scratch Area. Make a connection from the Scene object (Scene > Out Ports > Mouse Position) to the alpha-channel object (Alpha Channels > In Ports > Scraper Position).



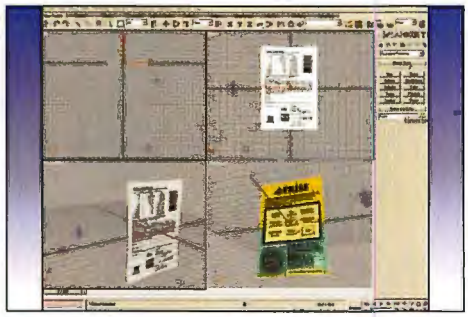
15 Make another connection from Scene > Out Ports > Mouse Position, to Alpha Channels > In Ports > Stamp background.



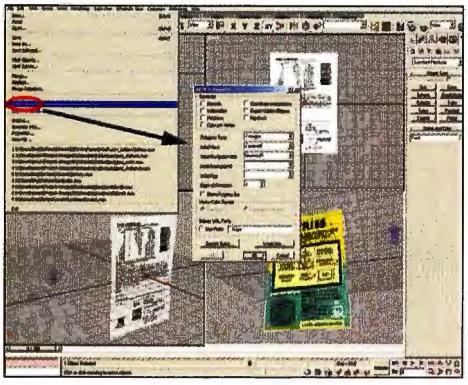
16 The first connection positions the Scraper image after the mouse position when dragging the mouse over the Surface. The second connection makes a stamp of the Scraper image in the background every time it's repositioned, i.e. these connections let you draw with the Scraper image in the alpha channels.



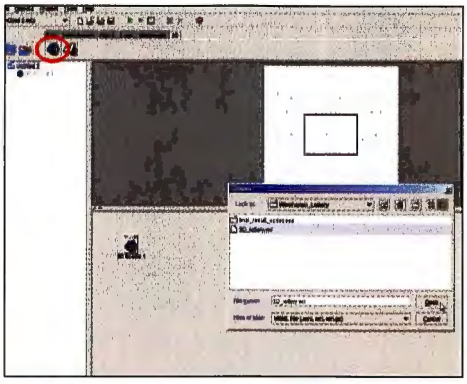
17 Press the green Play button to test your lottery ticket. Then save your project (File > Save As). Name it Lottery_2D.wfp.



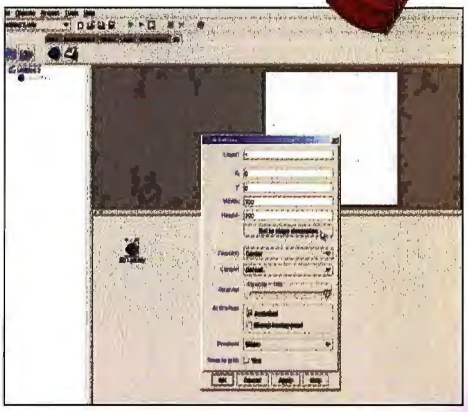
18 In *3ds max*, create a simple 3D ticket with one texture at the back (back.gif) and another at the front (ticket.gif). We also add a Target Camera and a NavInfo, found under VRML Helpers. Set the NavInfo type to Examine and Speed to 40. If you don't have *3ds max* or don't want to create the 3D model, then jump to step 19.



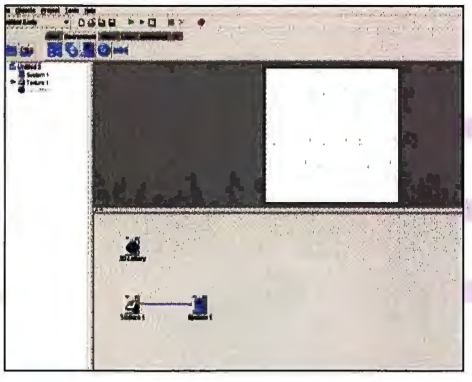
19 To export the 3D ticket, choose File > Export, name it 3D_Lottery.wrl and save it as VRML97. Unmark all tickboxes in the VRML97 Exporter dialogue. Make sure to place the VRML file and the textures in the same folder.



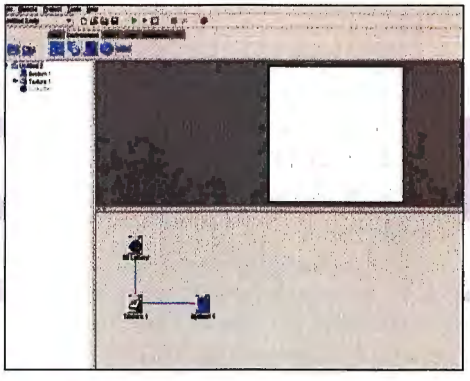
20 Go back to *WireFusion* and start a new project. Set the Stage dimensions to width 300 pixels and height 300 pixels. Insert a 3D Scene object, found under the 3D tab. Load 3D_Lottery.wrl.



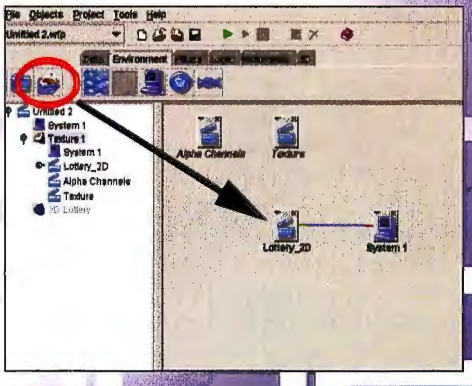
21 Rename the 3D Scene object as 3D Lottery. Dpen 3D Lottery > Target Area Properties, click on the "Set to stage dimension" button.



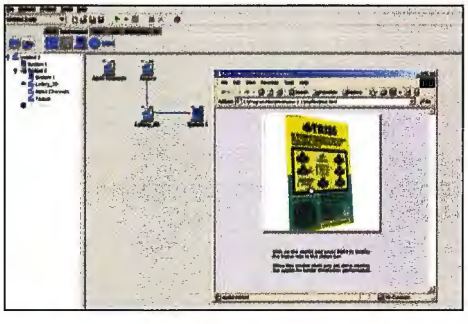
22 Insert a Texture object, found under the 3D tab, and a System object, found under the Environment tab. Make a connection: from System 1 > Out Ports > First Frame Started, to Texture 1 > In Ports > Push Texture.



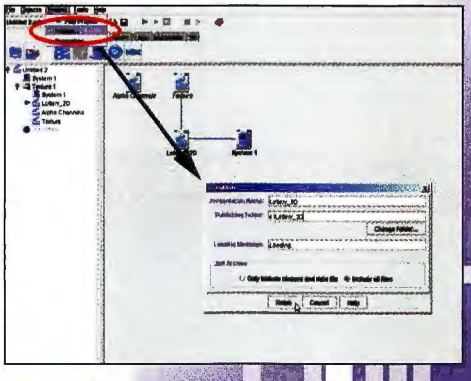
23 Make a connection: from Texture > Out Ports > Texture Pushed, to 3D Lottery > In Ports > VRML Nodes > Front Transform > Shape > Appearance > ImageTexture > Image.



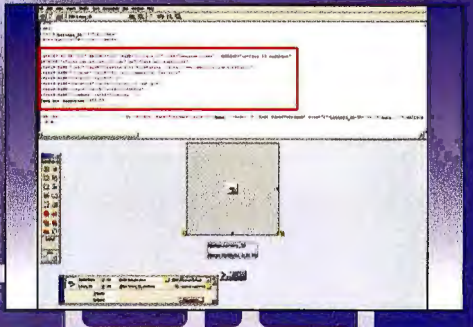
24 In the Object Explorer, select Texture. Import your previously saved 2D lottery, Lottery_2D.wfp. Insert a System object and make a connection: from System 1 > Out Ports > First Frame Started, to Lottery_2D > In Ports > Push Scene.



25 Make another connection: from Lottery_2D > Out Ports > Scene Pushed, to Texture > In Ports > Replace Scene. This will replace the 3D front texture with your interactive Lottery_2D presentation. Press the green Play button to test. To rotate, press Ctrl+Alt+Mouse. To zoom, press Ctrl+Mouse. To pan, press Alt+Mouse.



26 Save your project. File > Save As. Name it Lottery_3D.wfp. Choose Project > Publish. Specify the Presentation name Lottery_3D and where to publish it. Press Finish.



27 WireFusion automatically places the presentation within HTML code. You can paste it into your HTML editor. Make sure to have the Lottery_3D_package in the same folder as your HTML file. Upload everything to your server. The WireFusion player is required to see the presentation on the web browser.

Q and A

If you have a question for our 3D experts send it to us at **3dw.qanda@futurenet.co.uk**
You can find more Q&A advice on our Website at **www.3dworldmag.com**

Q: How can I get rid of the thousands of error messages when I load my *LightWave* scene on my friend's computer?

HUGH JAMPTON, LANARKSHIRE, SCOTLAND

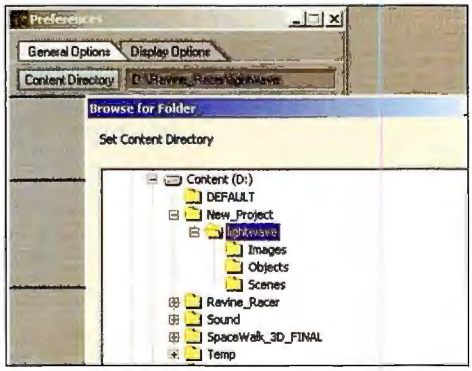
LIGHTWAVE SPECIFIC

A: Working in *LightWave* is a pretty straightforward business, and you can happily load and save files without bother on a single computer. However, if you want to load the project on another machine, either over a network connection or via a CD or Zip disk, you might find yourself confronted by dozens of error messages such as "Can't find Object" or "Can't find image" and prompting you to find the file and load it yourself. If you find yourself in this situation it comes about from not understanding the structure of *LightWave*'s Content directory.

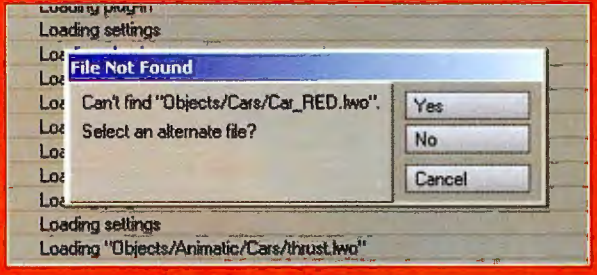
When you install *LightWave* the software resides in a folder on your system disk called C:/LightWave3d. Inside this folder you'll find many different folders, among them three called Scenes, Objects and Images. If you load LightWave and press [o] to bring up the options panel you'll see the Content directory is set to "C:/LightWave3d" (assuming you haven't already changed it). This means that when you try to load a scene, *LightWave* will automatically look in C:/LightWave3d/scenes for the scene file. When you choose one and open it *LightWave* will look in C:/LightWave3d/Objects/ and C:/LightWave3d/Images/ for the object and image files respectively.

But let's say that you've saved all your *LightWave* work to a folder called D:/work. If you load an object (such as D:/work/monsters/scary.lwo) and then save the scene, since the file isn't in the Content directory, LightWave will save the *absolute* path for the object. You can confirm this by opening the scene file in a text editor such as *Notepad* on the PC or *SimpleText* on the Mac. You'll find a line saying: "LoadObjectLayer 1 D:/work/monsters/scary.lwo". This is all very fine and well, but when you try to load the files on another computer *LightWave* gets confused because it can't find a folder D:/work/ on this new machine.

The solution to the problem is to work within the Content directory. If you press [o] again to bring up the options panel you can set the content directory to D:/work. Then within D:/work create three folders: Scenes, Objects and Images. If you make sure that all Objects are kept in the Objects folder and all Images in the Images folder, then when you save a scene *LightWave* will use a *relative* path for the files: Objects/monsters/scary.lwo. So if you copy the whole Content directory to a different computer, all your friend has to do is set his Content directory to the new one and load the scenes.



It's actually worthwhile establishing a different Content directory for each project you take on. This makes it easy to back up a project and all the files associated with it, or remove it from the system when the job is finished. The disadvantage is that if you have common images or objects that you'd like to use in more than one project, you'll have to copy them to both Content directories. **BEN SMITH**



RIGHT If you try and load a scene without setting the content directory properly you might find yourself under a barrage of maddening "File not found" errors.

TOP RIGHT Set the content directory in the options panel to solve the problem. It needs only Scenes, Images and Objects folders to work, although you can add more for stuff like Animations and Renders.

How can I create a realistic "3D" nebula using *Cinema 4D*? I can never get it looking right.

BRIAN BEAUCHAMP, VIA EMAIL

C4D SPECIFIC

Ahhh – the age-old question. What you need is a true volumetric rendering. In this day and age our 3D applications have finally provided us with the tools and speed needed to achieve true volumetric rendering. Not only can we now create nebulae with ease – we can create muddy water, dust storms, plumes of smoke, gases and solid transparent objects such as marbles, ice and fluids. *Cinema 4D* makes this easier than ever, and easier than most other 3D applications. The key to this power is lights. It's all about lights.

If you've used *C4D* for any time you know it has great tools for visible and volumetric lights. You can make lights visible with smooth transitions or add texture to emulate mist, smoke, fire or a nebula. Noise can be added to make the volume look dusty and the texture in the volume can be animated to emulate the boiling of an explosion or the surface of a sun – all this in 3D so you can fly through or around the volume for truly film-quality effects.

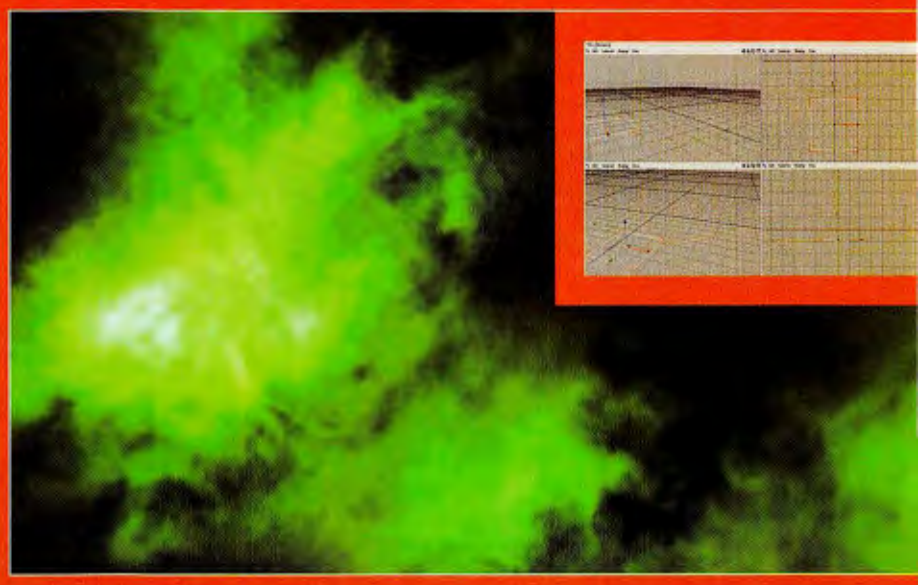
The visible and volume controls for lights are excellent, but a single omnidirectional light is not going to cut it. Although a single omni can be use to create a sun, a nebula will require many more, hundreds more. You need particle systems. Particle systems will enable you to shape your nebula as you see fit. In the following exercise you will create the perfect visible omni light, add it to the perfect particle emitter and animate the emitter to create the perfect nebula shape.

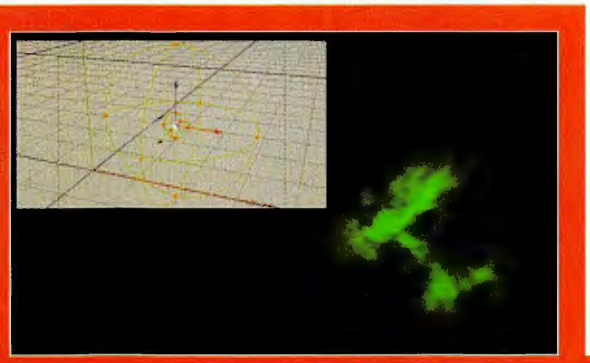
For this project set your animation length to 150 frames and 30fps. First the light. Define a single light, set its type to Omni, its shadow to none, Visible Light to Visible, and Noise to Visibility; make sure that Show Visible is ticked. You can leave the light colour as white, for the colour will come from the visible settings. On the Details tab you don't need to make any changes – this light will not be illuminating anything. On the Visibility tab, set the inner distance to about 50 and the outer distance to 300 – these you will want to play with, as they make a big difference on the look of the volume. Tick custom colours and pick an inner and outer colour – here I've used bright green and bright blue. Don't concern yourself with any of the other settings for now but come back later and have a stab at them – dust and dithering can add some interesting effects. On the Noise tab, set the type to wavy turbulence, the key to a cool nebula look, the brightness to –90 and the contrast to 210, which provides a nice separation or pattern to the volume. Set the scale to 150ft for x, y and z and untick Use Local Coordinates. This tickbox is very important: tick it and you'll end up with a very unrealistic-looking nebula, so untick it. Render your light – it should look something like figure 1.

Next we need to create and animate the particle emitter. Add an emitter to your scene; on the particle tab set the birth rate to 12 for both editor and rendered. Set the start emission to 0, the stop to 150, set the life to anything over 150 and the speed to 5ft (I've had peculiar results with a setting of 0). For now, leave Show Objects unticked. Go to the Emitter tab and set the type to pyramid, x and y lengths to 400, and horizontal to 90. These controls affect the way the particles are emitted. Your emitter is now ready for the light: simply drag the light into the emitter.

The next step is to animate the emitter, so we lay down the lights along a path to define the shape. Check out figure 2 to see the path I set up for this nebula. I simply moved the emitter to a new location every 30 frames with the auto keyframing turned on for position. I then tweaked the keys to get just the shape I wanted. The emitter is now moving along the path over 150 frames laying the lights down in an area that will be the whole of the nebula. See figure 3 for the final render of the nebula. Add some stars, perhaps a view from a spaceship bridge, and *voilà*, you are James T. Kirk.

FRANK VITALE





BELOW – Figure 1 – A single light with settings as described. Looks good but we have no control over the shape of the nebula.

ABOVE – Figure 2 (inset) – The path to animate lights. Figure 3 (main picture) – The final nebula. For added interest try using two emitters with different paths and colours and a single or a few large stars.

Q. I'm making an organic model in *Maya*. How do I attach two NURBS shapes together so that the joined section is flexible and yet still stays attached to the shapes?

GARETH MCDONNEL, VIA EMAIL

MAYA SPECIFIC

A. I'll answer this question by modelling a tadpole-like creature. The join between head and tail will stretch and bend as the tail or head is animated.

First define a NURBS sphere. In the channel box give the sphere a radius of 2. Give it 12 sections and 6 spans so there's a bit more geometry to play with. Stretch the sphere out a little in the z-axis to give it a more elongated shape, like a tadpole head.

Now we're going to cut a hole in the sphere. Do this by selecting the sphere and clicking on the Make Live button (the magnet at the top of the screen). The sphere will turn a darker green, as it is now a live object. Go to the Create menu and select the CV Curve tool. Draw a curve at the rear of the sphere. This is where we'll make a hole to attach the tail. Notice how the Curve Tool draws directly on the sphere's surface. Hit Enter to complete the curve. Deselect the sphere and the curve. Click on the Make Live button to stop the sphere being a live surface.

Now Shift-click on the curve, then the sphere, to select both. Go to Edit Surfaces and select the Trim tool. The sphere turns grey. Notice how the area inside the curve is shaded differently from the area outside the curve. With the Trim tool, click on the area of the sphere you want to retain. A small yellow square appears. Hit Enter. The sphere now has a hole inside the area enclosed by the curve.

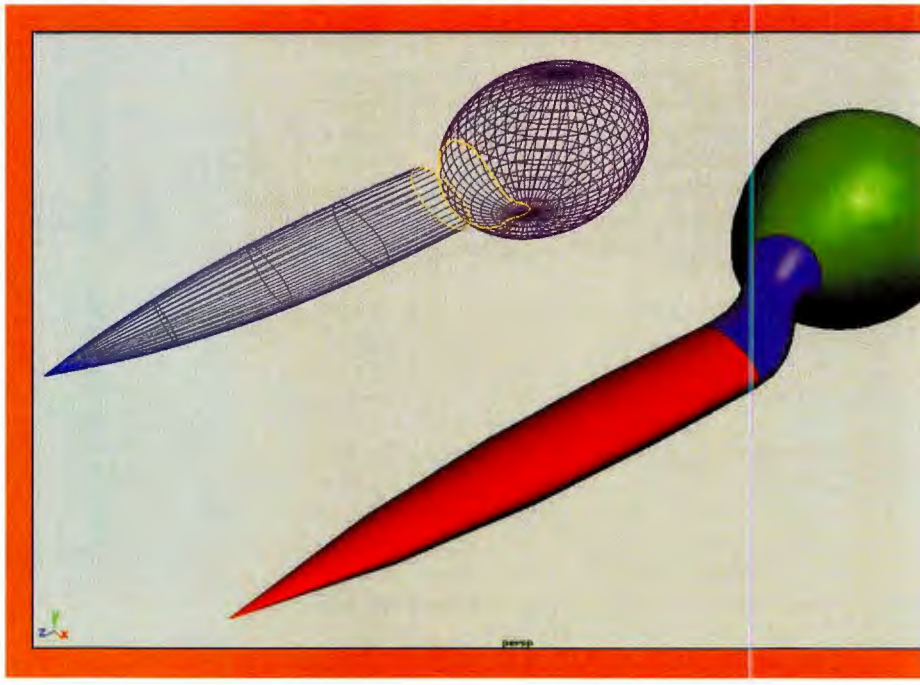
Make a tail for the tadpole by creating a NURBS cylinder. Rotate it in the z-axis 90 degrees. Scale it in the y-axis to flatten it a bit. Scale the CVs at the tip of the tail down to a point.

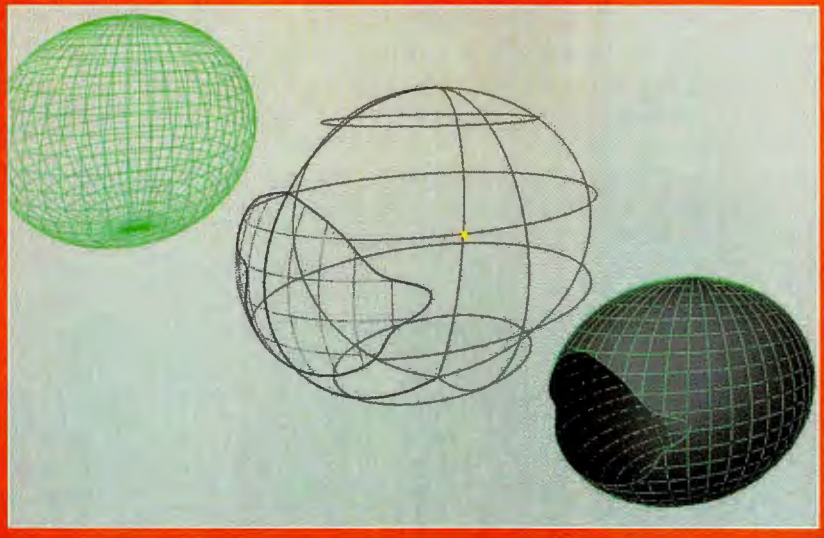
Now to join the two shapes. Go to Edit Surface > Surface Fillets > Fillet Blend. With the Fillet Blend tool active, select the curve on the edge of the sphere's hole. It will highlight yellow. Hit Enter. Now select the curve at the front of the tail. Hit Enter and *Maya* computes a shape to blend between the two curves.

Now you can move either the head or tail of the creature, and the freeform-blend surface will bend and stretch organically while remaining attached to the two parts of the model. To make the NURBS cylinder tail wriggle and bend, add a Lattice Deformer to it.

Once you've mastered this technique you can apply it to all sorts of organic models. You could attach the curves on the jaw of a dinosaur to curves on its skull. As well as linking the jaw to the rest of the body, the blend between the curves would stretch like real skin as the jaw flexed. Adding a suitable texture would make the blend seamless.

GEORGE CAIRNS





LEFT Making a shape 'live' allows you to draw a curve directly onto its surface. The Trim tool can then cut a hole inside the curve.

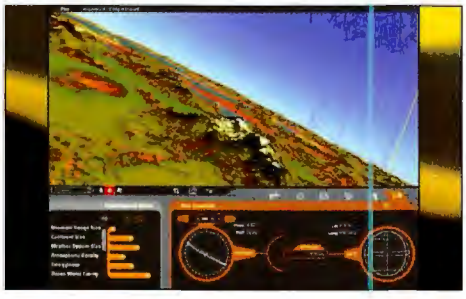
ABOVE A game of Pin the Tail to the Tadpole, anyone? There's a flexible join between the tip and tail, thanks to the Fillet Blend tool.

Get your Mojo working

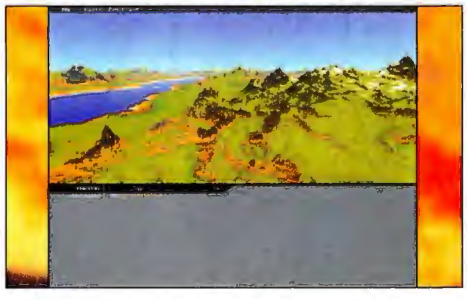
MojoWorlds are places to be explored, and there are plenty of ways to do it

1 *MojoWorld Transporter* starts up with the default planet. The top half shows the Real Time Renderer (RTR), which attempts to display the planet in close to real time. On the left are three icons for switching between the three movement modes; in the middle are the three buttons to control rendering; and on the right are six buttons for accessing various controls.

2 You start in Walk mode. Use the cursor keys to move about the planet's surface (you rise and fall with the terrain as you move). Pan the view using the mouse in the RTR, and use the M and N keys to move up and down. Click the far-right button to see the Nav Console and get absolute coordinates for your position. You can also use the controls here to change your position directly.



3 Switch to Fly mode (the middle airplane symbol on the left): tricky to control but great to make fly-through animations. Hold the up-cursor key to accelerate gradually; decelerate with the down key. Drag left and right in the RTR to bank, but be careful: it's easy to overdo it and get horribly confused. UFO mode is similar but the velocity of the camera depends on its altitude.



4 Wander around to find an interesting spot, then do a render. The three middle buttons let you crop the render window, start a render, and change the render quality respectively. Click the mid-right one and choose Normal rendering quality, then start a render. The image slowly appears in the RTR window. Click the Save to File button to save it.

5 Making an animation is simple. Click the movie-camera symbol for the animation interface. Get into position on the MojoWorld and then walk or fly across it (flying is much better for animations). Click Record whenever you like. *Transporter* tracks all your movements; when you finish, hit Record again to stop. You can then play back the animation in real time using the controls.

6 The easiest way to render multiple images and animation is to add them to the Uplink Queue. To do this choose "Process later" from the render button or the animation dialogue. In the Uplink Queue (second button from right) you can check and change the settings for your queued renders and assign them filenames, then set the whole lot rendering while you get some sleep.

mojoworld

MojoWorld may seem an intimidating place but it's easy to find your way around – and a whole galaxy of fractal craziness awaits... **BY ED RICKETTS**

All the images for this tutorial can be found on the cover CD

Andromeda's *MojoWorld* is an entirely new breed of landscape generator – and one that's not particularly easy to understand at first glance. Actually 'landscape' is a bit of a misnomer, as *MojoWorld* creates entire fractal planets, generated on the fly using mathematical algorithms. These planets can be adorned with equally complex fractal materials and atmospheres to produce realistic earth-type worlds or bizarrely surreal alienscapes.

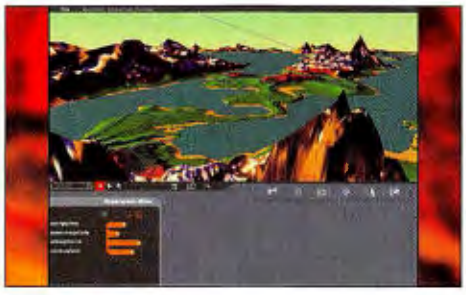
The commercial version of *MojoWorld*, called *Generator*, provides full planet-creation capabilities – but you don't need to spend dosh to experience MojoWorlds. *Transporter*, the free downloadable version (on the cover CD), lets you load and explore *MojoWorld* planets – which contain essentially infinite detail – and render stills or animations of the interesting places you discover.

Transporter has a fairly simple interface but also contains a few handy features which are not immediately obvious. Let's take a wander through *MojoWorld* and see what delights await...

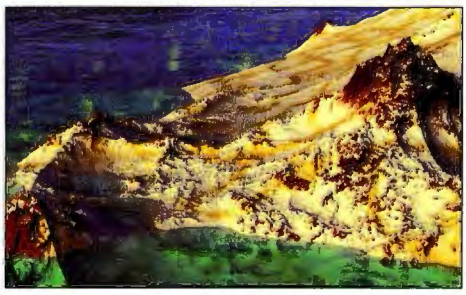
Incidentally, for a paltry $30 you can upgrade to *Transporter Pro*, which removes limits on image-size rendering and a few other restrictions.

Ed Ricketts is the editor of *3D World*. He's worked on more computer-related magazines than he cares to remember and freely admits to being a full-on *3ds max* devotee. Chat to him at **ed.ricketts@futurenet.co.uk**.

1 You can also use the Log dialogue (third button from left, looks like a postcard) to save the coordinates of any interesting places you find. Click Add to make a new entry, then edit the title and description to remind yourself what it is. You can instantly transport to a saved setting by clicking the Jump to Entry button under its thumbnail image. Movies can be stored here too.



2 *Transporter* doesn't let you create planets from scratch, so use the Settings sliders to alter certain aspects of a world (assuming the planet's creator has included any – not all have them). Move the sliders to alter their individual aspects (again, these vary from world to world) and hit the Jump button to activate them. Or use the Random/Perturb settings to go wild.



3 Quite a few sample planets are included with *Transporter*, most of which have configurable settings. And with the size of each planet, there's a lot of exploring to be done. The best way to discover more of *Transporter*'s complexities is just to explore; if you like it and want to do larger renderings, you can always upgrade to the Pro version for a mere $30.

Provincial perspective

Don't compromise your ideas because of expensive Soho charges. Just look further afield...

BY RICHARD SCOTT

Sitting in San Antonio airport, Texas, has started me thinking just how important location is in the CGI industry. I've just travelled for 27 hours to use the services of a company in the US, so for me distance and travel isn't a problem.

After all, everyone talks of the 'global village' and the use of the 'information superhighway' negating the need to work with local companies. In many ways this is true. Axis, the animation studio I work for, is based in Glasgow, Scotland, and finds itself working regularly with clients and service companies all over the world. We find that being a 'global' company is the best way to work. In the past we have worked on projects or used services from companies in Scotland, the north of England, London, France, California, Seattle and Texas. We try to live up to and maintain the 'global village' ethos – it gives us the most creative and interesting clients and access to the best services in the world. All of that can only be good for us as a company.

It seems, though, that elsewhere in the UK this 'global village' ideal is not embraced as much as you would think. On recent trips to London trying to crack Soho – and believe me, sometimes it can be a tough nut – there are feelings of trepidation about using any animation studio 'all the way up there in Scotland'. Worries of quality, communication, skill set and, of course, distance all come across. I have even heard stories of production companies cutting shots from their commercials or broadcast projects because their budget would not stretch to the rates of a London facility. If they had looked outside of Soho to where rates are more cost-effective and in many cases the quality is comparable, they would not have had to compromise their idea and could have still blown everyone away with their creative vision intact.

> THIS GLOBAL VILLAGE IDEAL IS NOT EMBRACED AS MUCH AS YOU WOULD THINK

What everyone needs to realise is that outside of Soho all over the UK there are talented, top-quality 3D artists and animators working for animation studios who produce excellent work, and every day they communicate with other like-minded people all over the globe. Working cleverly, using all the tools available, including the Internet and even newfangled technology like telephones and planes, it is possible to keep a client or art director up to date with the daily progress of the project.

Delivering images and movie files regularly in a 'dailies' format similar to that in the feature-film industry works seamlessly across continents and time zones. This technique has been successful for us for many years.

Conventional broadcasts and films have been successfully produced in all regions of Britain for years, so let's hope that CGI and visual effects follow this lead and that we continue to have strong, creative studios who are more than capable of competing with the best of Soho.

RICHARD SCOTT is the creative director at Axis Animation. Visit their site at www.axisanimation.com

Fusion image produced entirely in CINEMA 4D XL and BodyPaint 3D by Yoichi Mimura © 2001

It's going to be a bad hair day

You know the feeling. The client has asked for state-of-the-art graphics for the rollout of her new product range. You've been slaving away for weeks, fighting software crashes, sluggish workflow and tediously slow render times. It's enough to make anybody's hair stand on end.

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A NEMETSCHEK COMPANY

Maya 3.5 Mac

The mighty *Maya* joins forces with the Mac. A dynamic duo or the odd couple? **BY GEORGE CAIRNS**

PRICE £ £6,360 ($9,000)

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MINIMUM SYSTEM
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- G4 chipset
- 512MB of RAM
- ATI Rage 128 or ATI Radeon graphics card
- Three-button mouse

MAIN FEATURES
- Polygon, NURBS and Subdivision modelling
- Trax Editor
- Paint Effects
- Integrated Particle System
- Interactive photorealistic rendering (IPR)

We're guessing most people reading this are Mac users who are wondering if *Maya* is all it's cracked up to be, especially now the Mac has evolved again. With a new Unix-based operating system you can now bring *Maya* home to your beloved platform, instead of struggling with a PC or Linux. This is a significant step for both A|W and Apple.

As the new version number indicates, this is Maya 3.0 plus a few extra features. Specifically, the Mac version includes native support for QuickTime (at last), tear-off menus in the hot box, and a fully Aqua-compliant interface. Otherwise, though, the Mac version is identical to the PC and Linux 3.0 release.

So, what's *Maya* like running on a Mac? Well she's a hungry beast, coming with a recommendation of 512 MB of RAM to keep her happy. But once you've got her installed and licensed she takes to the Mac like a duck to water.

LEAN AND MEAN

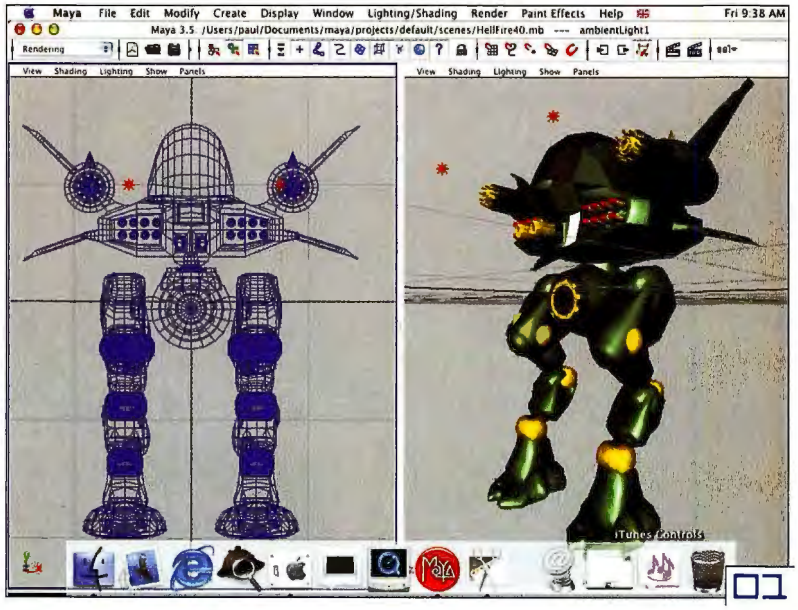
One of *Maya*'s strengths is the fully customisable user interface. You can have everything in your face cluttering up the screen, or trim things down to the bare minimum, according to your method of working. Tap and hold the spacebar with the cursor anywhere on the screen and you invoke the Hotbox. This gives you access to any menu you might require. Combine this with keyboard shortcuts and you can have a very streamlined interface indeed.

When you do open a floating menu box like the Attribute Editor, it makes use of the Mac OS X Aqua interface giving you a drop shadow over the *Maya* interface in the background.

The big guns of *Maya* invade the Mac, thanks to OS X

POLYGONS, NURBS AND SUBDIVISIONS – OH MY!

As well as the obligatory NURBS and polygon shapes, *Maya* features subdivision modelling. With a topology different from NURBS, subdivisions enable effective modelling of organic shapes that have branching structures, such as hands and faces. They are also better for modelling areas of a character that need to stretch, such as the corner of a mouth. With NURBS models these areas could be prone to such artefacts as cracking and bunching up in unwanted folds. Subdivisions give the modeller and animator greater control of those areas.



01

MAKING TRAX

The Trax editor is both a motion compositor and motion non-linear editor. Trax uses character nodes and

GENERATION OS X

Macs have traditionally been popular with creative types who require access to software without having to bother about what goes on 'under the bonnet.' Some professional users shied away from the Mac platform in the past, as they needed a system with which they could interface as well as drive.

Mac OS X is designed to provide the best of both worlds. It combines the power and stability of Unix with the ease of use of the Mac. The Aqua interface makes things even more intuitive for new users while providing powerful customisable tools for professionals. At the foundation of OS X lies Darwin, an industrial-strength Unix-based core operating system that delivers stability and performance. Darwin provides Mac OS X with protected memory, pre-emptive multitasking, advanced memory management, and symmetric multiprocessing – making a more responsive and more stable Mac.

sub-character nodes, each dealing with separate aspects of your animation. Take the robot in our main image as an example. We could have one character node of the creature's standing pose, another node containing data about the rotation of his gun barrel and a third containing some walking key frames. In the Trax editor you can place these poses and actions in any order you choose. Trax then blends them into one motion sequence. Going from standing to a walk is simple, as Trax fills in the gaps between the two actions. You can edit the blends between motion data with *Maya*'s Graph Editor. You can even split blended clips into pieces, insert yet more keyframes or other animation data, and blend these into a new sequence. Because you're animating in layers you have more overall control. Trax is as revolutionary for 3D character control as non-linear editing was to video.

PAINT YOUR 3D WAGON

As well as some versatile texture-mapping controls *Maya* offers other ways to apply textures to your geometry. With Paint Effects can use a brush to paint a texture onto your 3D object, then paint on a bump map. You can give a creature glowing eyes by painting on an incandescence value rather than having to go into the texture's Attribute Editor. Paint Effect's brushes are fully animatable, and many of the presets have built-in dynamics settings such as turbulence and gravity. Paint Effects works interactively with IPR – the interactive photo-realistic renderer. As you paint onto your 3D geometry the IPR updates automatically.

Seeing *Maya* on the Mac is like seeing Superman and Batman team up – definitely a dynamic duo. It's a joy being able to create textures in *Photoshop* and bring them straight into *Maya* on the same platform (of course, this is still possible on the PC, but for die-hard Mac fans, well...). You can also render out animations and import them straight into After Effects for compositing.

If your creative pipeline involves Macs then adding *Maya* for Mac OS X to the setup will greatly streamline your workflow. A minor downside for existing *Maya* users wanting to use *Maya* on the Mac is that you may already familiar with version 4. In other words, you might occasionally find yourself looking for a *Maya 4* feature familiar from another platform which simply isn't there in this version.

Another reservation is that the documentation says *Maya* has been qualified to run only on OS X 10.0.4. That doesn't mean it that it won't run on the newer 10.1, but that Alias doesn't officially support it.

Bottom line? This is Maya undiluted. Running on a Mac doesn't make the package any better, but it does open up a whole new market for those loathe to use other platforms.

ROCKY ROCKETEER COURTESY OF: Alias|Wavefront Santa Barbara Customer Services Team.

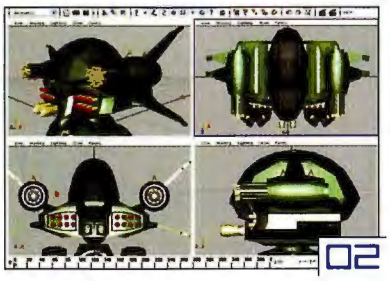
04

[01] *Maya* integrates perfectly with the Aqua interface. When minimised it sits happily in the dock at the bottom (or side, if you prefer) of the screen, waiting to be summoned.

[02] Tap the spacebar over any of the four views to make that view fill the screen. Tap the bar again to go back to the four views.

[03] Floating windows make good use of the Mac OS X's aqua interface.

[04] *Maya* for Mac OS X's integrated particles, dynamics and powerful character-animation tools were used to build this image of Rocky Rocketeer. The enhanced quality of the character's textures result from *Maya's* latest improvements in file-texture rendering.



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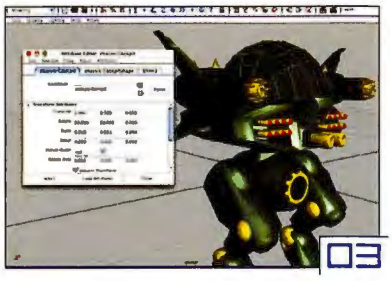


03

3Dworld Verdict

PROS

•Customisable user interface • Streamlined work flow with other Mac applications • Excellent tutorials and documentation (PDFs)

CONS

Not the latest version that's running on other platforms

PURE

Your very own RenderDrive at a fraction of the cost? Surely not... BY PETE DRAPER

PRICE £2499 $3699

SUPPLIER Advanced Rendering Technology

CONTACT +44 (0)1223 503 854

WEB www.art-render.com

Unless you've been buried in a 3D hole for the past few years, you will undoubtedly have heard of ART's RenderDrive system: a standalone computer dedicated to rendering. It uses its own specialist hardware, a rendering PCI card. With a fast Ethernet connection to a computer and links to 3D software such as *max* and *Maya*, the end results are amazing – but at a cost. RenderDrive is too expensive for most 3D design houses.

So ART has cut down the system into something a little simpler but without sacrificing quality or much speed. The PCI card has been ripped out of RenderDrive and is now available as a standalone product named PURE. By plugging this baby into your own PC, you've pretty much got your own RenderDrive on your desktop, at a fraction of the price, with all the features intact. And what features!

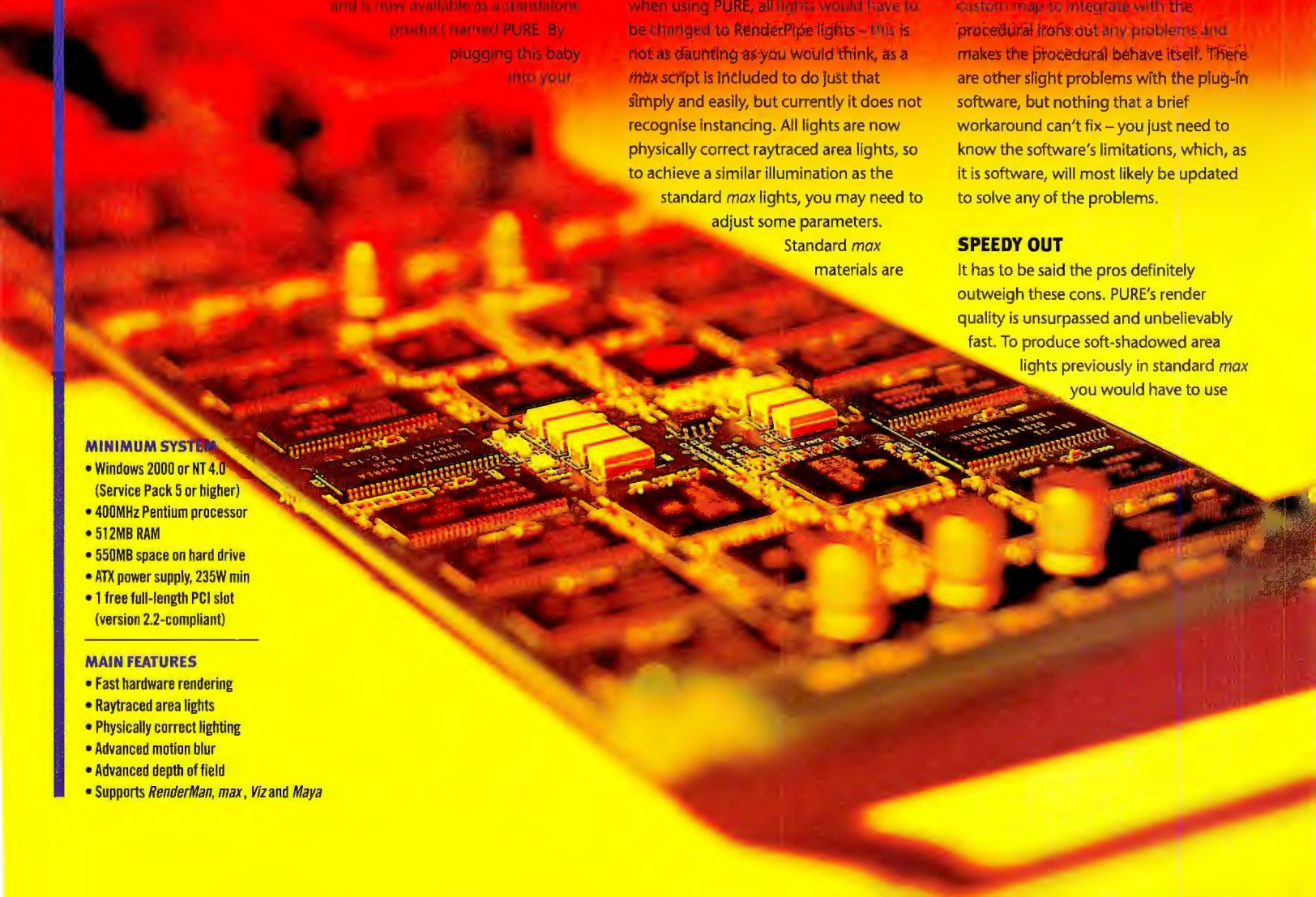
EASY IN

Installation is straightforward. The card we reviewed didn't like BIOS plug-and-play enabled, but this is pretty much negligible and is scheduled to be fixed. Tested with *3ds max 4*, *max* communicates to the PURE card via the RenderPipe render plugin, while the rest of the features are integrated into *max* under relevant sections. To have any noticeable benefit when using PURE, all lights would have to be changed to RenderPipe lights – this is not as daunting as you would think, as a *max* script is included to do just that simply and easily, but currently it does not recognise instancing. All lights are now physically correct raytraced area lights, so to achieve a similar illumination as the standard *max* lights, you may need to adjust some parameters.

Standard *max* materials are partially supported. PURE does not handle the raytrace material but it does support flat mirror, raytrace, reflect/refract and thin wall refraction maps, so some amendments will be required to bring an existing scene up to speed – this is not difficult and worth the effort for better results. More disappointingly, PURE has slight problems with the Morpher material, does not support Shadow/Light falloff and has a limit on UVW maps that can be used in any one material. Most procedural textures are directly supported, but can produce slightly different results from a standard render. A provided custom map to integrate with the procedural irons out any problems and makes the procedural behave itself. There are other slight problems with the plug-in software, but nothing that a brief workaround can't fix – you just need to know the software's limitations, which, as it is software, will most likely be updated to solve any of the problems.

SPEEDY OUT

It has to be said the pros definitely outweigh these cons. PURE's render quality is unsurpassed and unbelievably fast. To produce soft-shadowed area lights previously in standard *max* you would have to use



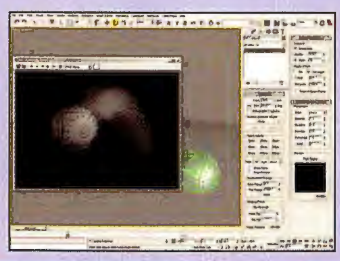
MINIMUM SYSTEM
- Windows 2000 or NT 4.0 (Service Pack 5 or higher)
- 400MHz Pentium processor
- 512MB RAM
- 550MB space on hard drive
- ATX power supply, 235W min
- 1 free full-length PCI slot (version 2.2-compliant)

MAIN FEATURES
- Fast hardware rendering
- Raytraced area lights
- Physically correct lighting
- Advanced motion blur
- Advanced depth of field
- Supports *RenderMan*, *max*, *Viz* and *Maya*

PICTURE COURTESY OF: © Gavin Roberts

DEEPLY MOVING

PURE'S DEPTH OF FIELD and motion blur knocks any 3D software for six. Accurately calculating the motion of the object, its surroundings and the viewing camera, PURE gives a motion-blur effect never seen before in a rendered image. A completely different approach to other motion-blur systems such as Object, Scene or Image which either reproduce the object(s) over sub-frames or smear the image to give the impression of blur, PURE's motion blur is calculated by camera shutterspeed and flash, and its quality can be increased to ridiculous levels if so required. Basically, *max*'s motion-blur settings stop at 16. PURE's start at 16.



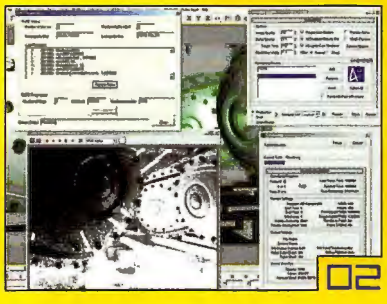
PURE's motion blur takes real-world camera values to generate outstanding results.

THE QUALITY SPINNER ENABLES YOU TO GIVE AN IMPRESSION OF LIGHT AND SHADE

either a script or, producing pretty much the same result, a raytraced spotlight linked to a dummy that follows a circular path with one completion per frame. Couple this with scene motion blur to composite the soft shadows, and you're looking at astronomical render times. PURE does all this quickly and simply, casting physically correct light with inverse-square fall-off. Additionally, light sizes can be designed to whatever size is required. You can create them to the right size so they cast physically correct light, view them in the render and flare them to the receiving camera.

To render to the PURE card, simply change the default production renderer. This removes Render Elements (which are not currently supported) and replaces *max*'s Scanline Renderer with RenderPipe's rollout. Here you can set the quality of the render, adjust detail settings to reduce render times (similar to optimisation) and actually set a desired render time per frame (although the quality may obviously be reduced to reach these times).

The quality spinner is one of the most useful features of the card: it enables you to degrade the render to give an impression of light and shade without having to concentrate on line detail. This quality value should normally be set around 100 depending on the resolution of the render, but can be set as low as 0 for a preview and up to 1000 – but there is no way on this planet that you would produce a render of that magnitude! A chalk preview can also be flipped on to check lighting and shading. A very small cost in render time yields a progressive update of our scene: it builds up in blocks (depending on render size) from a kind of preview state up to the final render. This tells you immediately if anything is amiss with the image, so you can adjust the scene accordingly. Combine these rendering powers, the ability to link several machines with PURE cards into a network, and *max*'s own network rendering set-up, and you've got your own RenderDrive network!



Overall, we cannot fault its quality. PURE is something most, if not all, 3D artists have dreamed of: fast, superb render quality and at an affordable price. The only faults we can put across are the (few) features not supported in *max*, yet *Maya* users may have more luck with it. Also, at the time of writing, this product was still at beta stage.

This card offers you an easy learning curve, handy and concise documentation, helpful sample files and friendly support with added wow factor. Oh, and did we mention you can use your own *RenderMan* camera light and material scripts? Superb! Definitely something for your Christmas list.

3Dworld Verdict

PROS

• Exceptional render quality • Very fast rendering • Easy to use

CONS

• Some *max* features not supported • Slight installation problem • Render cannot be paused to free CPU time

[01] The quality of raytracing and area lights that PURE provides is unsurpassed. If the quality appears to be too low, increase it simply by entering a higher value.

[02] At render time, we can view the scene being constructed from basic preview through to the high-quality end result.

eFX Pyro 1.0

ElectricFX's exotic new plug-in confirms that you can have smoke without fire...

BY STEVE JARRATT

PRICE $195 (£139)

SUPPLIER
ElectricFX

CONTACT
+1 604 731 1820

WEB
www.electricfx.com

MINIMUM SYSTEM

Macintosh
- Power PC processor
- 64 MB application RAM
- 1 MB on hard disk
- Mac OS 9.0.4 or above
- Adobe *After Effects 4.1*
- Web browser (to view User Guide)

Windows
- Pentium II processor
- 128 MB installed RAM
- 1 MB on hard disk
- Windows 98, 2000 or ME
- Adobe *After Effects 4.1*
- Web browser (to view User Guide)

MAIN FEATURES
- Realistic 3D flame and smoke generator
- Raytraced volumetric rendering
- Wireframe preview mode
- User-definable flame and smoke dynamics
- Wind and turbulence affect smoke
- Uses standard *After Effects* plug-in controls

Not many years ago, Atomic Power ported over Areté's *Digital Nature Tools* to create its *Psunami* ocean generator, a plug-in for Adobe *After Effects*. Now, electricFX has done a similar deal with *Pyro*. In essence, *Pyro* generates photorealistic 3D flames and smoke – nothing more. It uses a blank, Solid layer which can then be overlaid on existing footage either within a composition or as an exported movie file with alpha channel.

The single plug-in produces true 3D voxels which are animated according to the various properties. *Pyro* provides the ability to have three separate flame or smoke sources in a layer, with controls for flame and smoke dynamics, turbulence, lighting and wind. Sources can also be assigned as 'Air', producing an invisible stream which disturbs the flame or smoke flame column on cue.

Like *Psunami* before it, *Pyro's* volumetric effects are beautiful but time-consuming. A 15-second simulation, with a single flame and smoke source on a 320x240 layer, took over ten hours to render on a DP 800 Macintosh G4. Admittedly, this was on the highest-quality rendering, but for any detailed or close-up work, *Pyro* really does require the best settings. Without them, the results are pixellated and curiously stylised, as if hand-animated. They're not bad, just not photorealistic. (On its Website, ElectricFX provides sumptuous, high-resolution samples of *Pyro* at work – though heaven knows how long they took to render.)

While eFX has done a lot to speed up the process – including a wireframe preview mode unavailable in the *Maya* and *Softimage* versions – the procedural nature of the software means that you can't easily jump up and down the timeline. Previews therefore have to rely on wireframe or lowest-quality settings which, though useful, often give an unrepresentative view of the animation.

Pyro is also quite limited in its scope: it's adept at replicating matches, candles, Bunsen burners and so on – but it's difficult to generate large, roaring conflagrations (though there are other plug-ins available which would suffice).

> THE SINGLE PLUG-IN PRODUCES TRUE 3D VOXELS WHICH CAN THEN BE ANIMATED

Ultimately *Pyro* suffers the same fate as *Psunami*. It's a glorious plug-in, and it's hard not to fall in love with it. The resultant images are gorgeous but it's a fairly specific solution in search of a problem, and one which has already been solved elsewhere. While sitting waiting for individual test frames to render, you're often left wondering whether it would be quicker and less laborious just to film the real thing.

3D world Verdict

PROS
- True volumetric effects without a 3D application
- Affordably priced
- Extensive control over dynamics, colour and so on

CONS
- Painfully time-intensive
- Fairly limited in its scope
- No presets
- Online documentation only

SPEED IS OF THE ESSENCE

***PYRO* HAS A RANGE** of quality settings, allowing the user to do quick(ish) previews before committing to a full render. Besides being able to render fire and smoke separately *Pyro* also has the wireframe preview setting. Then, to speed up the rendering speed, there are different settings under Voxel Detail (low, medium, high, extreme) and Voxel Depth (shallow, medium, deep, extreme). The following pictures show the same scene at progressively higher settings for image quality.

[□1] eFX *Pyro* is capable of some startlingly realistic results... assuming you have the hardware and time to use it.

D Joiner

Design interactive 3D photo-panoramas and wide-angle images for £300. BY NICK NETTLETON

PRICE £300
$ 420

SUPPLIER
D Vision Works

CONTACT
+44 (0) 1235 437109

WEB
www.d-vw.com

MINIMUM SYSTEM
- PC: Windows 95/98/ME/2000

MAIN FEATURES
- Stitch images in a panorama
- No lens distortion or optical aberrations
- Export spherical, cylindrical or cubic panoramas
- Export flat projection
- Export interactive, Web-ready VR applet
- Import JPEG
- Export JPEG, BMP or TIFF

There's only so much you can get through a camera lens, and that's fact. Moreover, everyday photographic equipment reduces our world to a flat, two-dimensional snapshot in time: "Take it or leave it, viewer; this is the way my picture is."

For the serial 3D fanatic, *D Joiner* promises so much more – to stitch a series of photos into a single wide (or tall) image or grand panorama, without lens distortion or optical aberrations. You can choose from a selection of projections, or mappings, for your final bitmap: flat, cylindrical, spherical and cubic. Or you can export a Web-ready QuickTime VR-like interactive panorama, but in this case as a Java applet.

The whole process is fairly simple. You set up a new *D Joiner* project and choose your pictures using the multi-import feature. You need to specify how many rows and columns your images occupy (you can change this once you've started), and *D Joiner* makes a basic guess as to which picture goes where – but not in an "I can tell what your photos look like" way. It simply looks at the file name.

Using a Thumbnail mode you can now drag your images about to get them in the right order – and when that's done you're ready to start the stitching process. This begins in Marker mode, where you move between pairs of photos, clicking on one, then the other, to signify various matching points where they overlap. You've got to be accurate with this if you want a good result, but you'll find no automatic, or even supporting, features whatsoever: with *D Joiner* you've got to do all the work. Even a simple "snap to high-contrast edges" feature would be a great boon here, but no.

> SPLICE PICTURES WITH EASE – BUT IT COULD BE EASIER, WITH MISSING TOOLS

You can select, adjust and delete markers using a Select tool, but Control+Z will do nothing for you – an elementary oversight. And, irritatingly, to move between pairs of photos you need to use your arrow-cursor keys or head back to Thumbnail mode.

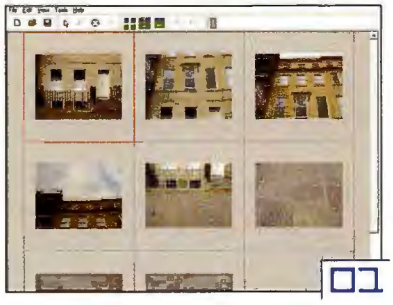
Once you're happy with your markers, a handy Preview mode offers a quick interactive, low-res render, where you can check your results before finally plumping for the real thing. Now, if you haven't got colour consistent in all your pictures you're going to get a nasty shock here. Aside from a little feathering, *D Joiner* does little to actually blend your images. A Curves feature *à la Photoshop* would be a dream here; better still an auto-matcher, but this may be asking a bit much for the price tag.

04


03

Nevertheless, assuming you've got your lighting right, the results are good, even superior, and even the quick and easy built-in JPEG compression engine does a good job. The VR Java applet is particularly impressive, and of course does not require Web viewers to download a plug-in.

All in all, a lack of auto-features and poor usability are *D Joiner's* most serious setbacks, and the documentation is disappointingly slim to boot. The software is also buggy, but it does the job it's meant to, and in good hands it does it well.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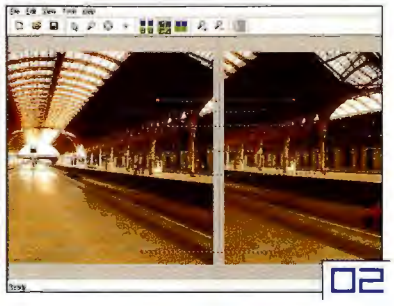

02

[01] You use *D Joiner's* Thumbnail mode to arrange your photos the right way round, a bit like a puzzle. It's a shame they have to conform to a grid.

[02] Using the Marker mode, you pick out matching points where pairs of photos overlap. Laborious at first, but with a little practice it gets easier.

[03] Get a quick low-res VR-style preview of how your panorama will look before you commit to the big render. This really is low-res, but enough to see if things look right.

[04] This is a cubic panorama, just one of five output options specifying how your stitched photos are rendered – one of D Joiner's great strengths.

3Dworld Verdict

PROS
- Good output quality
- Range of export options
- Exports VR Java applet

CONS
- No auto features
- Basic usability issues
- No colour-matching
- Buggy
- Manual on the skimpy side

World Builder 3

Must ease-of-use always go if you want power for landscape construction? BY MAT BROOMFIELD

PRICE Standard $399 Pro $999 (network rendering, *max* link, upgradeable licence)

SUPPLIER
Digital Element

CONTACT
+1 510 451 8020

WEB
www.digi-element.com

MINIMUM SYSTEM
- PII 300MHz
- 128MB RAM
- 40MB on hard disk
- Windows 98 or NT 2000

MAIN FEATURES
- Intuitive interface
- Import DEMs or design your own landscapes
- Extensive plant, terrain and texture libraries
- Plants can be affected by wind
- *max* Communicator interfaces with *3ds max*
- Area editor for quick application of terrain features
- Variator for generating plants and skies
- Flexible grass generator
- Vary the plant rendering mode according to distance
- No unwanted animation 'sparkles'
- Incremental rendering so you need render only the additions to a scene
- Import 3D models
- Volumetric lighting
- Grass that looks good close-up

Digital Element is a small US company that's been quietly winning the support of the 3D community over the past couple of years with its versatile *World Builder* program. *Bryce* and *Vue d'Esprit* may have been winning the magazine plaudits, and *World Construction Set* the big government contracts, but *World Builder* is a program that has advantages over all of them.

It's designed to enable you to create photorealistic 3D landscapes that can be animated, complete with atmospherics, volumetric lighting, foliage and imported models. It gives three distinctly separate ways of working, each of which suits the demands of a different type of task.

The most enjoyable and stimulating option is to build your own landscapes using skeleton lines. These are basic three-dimensional vector lines built from nodes. They represent mountain ridges, but the way that a skin (the mountain's surface) is draped over these skeleton lines determines the ultimate topology of your scene. Tightly conforming skin produces a very angular and geologically young mountain range; a looser fit produces smoother, softer lines resulting in the rolling hills of an eroded and older terrain.

If building landscapes from scratch is not for you, the program comes with extensive libraries of terrain features that you can assemble to create the scene that you want. Like all of the objects in the libraries, these are added to your project by dragging and dropping them into the appropriate window.

If you need to create landscapes out of real-world data, you can import digital elevation maps (DEMs) in a number of formats, including USGS maps and *Vista* files. These are converted into mesh files, which can then be rendered or textured as required. Within a scene, these meshes are displayed using only bounding boxes, making it hard to position the camera accurately. In handling real-world data, *World Builder* in fact offers surprisingly few options for processing and interpreting


01


02

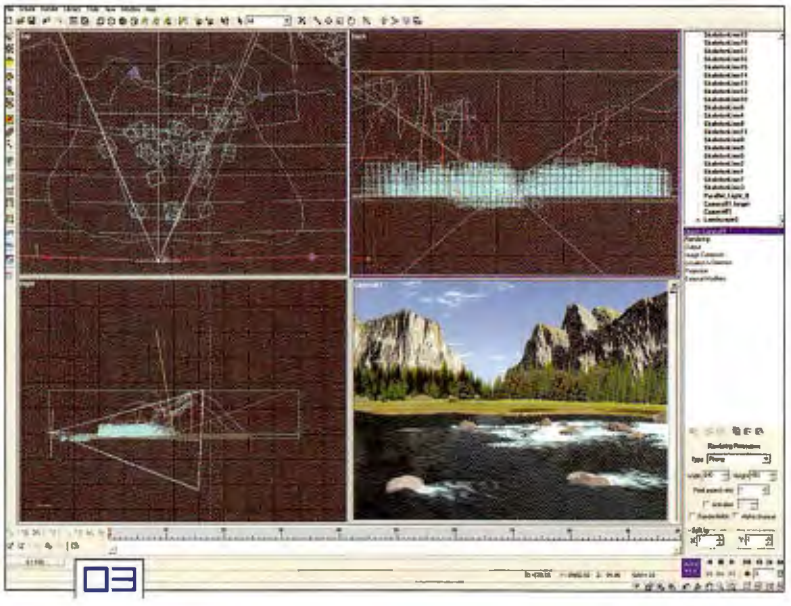
the data, and this seems to be because it treats the files as mesh objects rather than terrain. Therefore, the ability to sharpen or erode the terrain is not available with most DEM data.

Having created a basic terrain shape, you'll want to texture it. Again, tons of drag-and-drop procedural textures are available – you can customise these or create your own. Unlike *World Construction Set* (*WCS*), it's easy to set up assignment zones so that textures apply only at certain altitudes or on slopes within a particular range of angles. However, we were less happy with the quality of the textures, which looked less convincing than those in *WCS*.

One of the very best features in the program is the way that you can quickly create freehand shapes within which you can create localised features, be they a difference in colour, water, a sandy shoreline, grass growth, clusters of trees, or whatever.

Another invaluable feature is the program's Incremental Design feature: You render a scene, and the image is then stored. When you add further features, such as plants, shadows or reflections, only the additional objects need to be rendered and composited into the z-buffered image, greatly reducing overall test-render times.

We found the shaded OpenGL preview to be particularly slow at times. But this may be more to do with the program's ability to create and store millions of individual foliage objects, than to do with


03

[01] It's easy to do mountainous terrain, but with its area editor, *World Builder* makes it easy to breathe life into flat terrain too.

[02] Nothing stops you from fashioning some really out-of-this-world pictures.

04

any weakness in the renderer.

One way to relieve stress on the renderer is to treat scene components, such as plants, as 'flipbooks'. This treats them as 2D objects, which are then z-buffer-composited into the image, with shadows, reflections and so on. The program then need not render millions of polygons unnecessarily. At a certain distance from the camera, *World Builder* automatically makes this switch in approach but you can also incorporate your own 2D images if you wish.

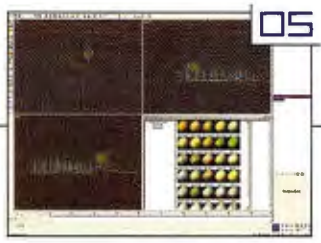
A program this extensive has an inevitable learning curve, but everything about the program is as logical as you could possibly wish. It is intuitive and enjoyable to use. We got further in one afternoon with *World Builder* than we have in a month with *WCS*.

As yet, the program doesn't come with a printed manual; it comes as PDF only. Digital Element says it's in the process of producing one, which is little comfort to existing users. On the plus side, numerous animated tutorials can be downloaded, which teach you the basics quickly. The company says it intends to include these with future purchases.

There are two versions of *World Builder*, but the more expensive Pro version comes with special communicator module that interfaces directly with *3ds max* so both programs can exchange lighting and camera data automatically: when you render in one, you render in the other. Without manuals, we were unable to get this feature working at all. The Pro version can also use up to 200 networked computers to render complex animations.

Despite a few irritations, the worst of which were the program's occasional instability and its apparent gluttony for memory, we still found using Digital Element's *World Builder 3* enjoyable and inspiring. If you're searching for a program that combines the accessibility of *Bryce* with the power of *World Construction Set*, and *World Builder* is very close. Digital Element says the program has been used to design a real golf course – but that's more a tribute to the course designer's determination than to the program's suitability! *World Builder* is not so much a geological tool as *WCS*: it's for graphic artists or animators.

It's powerful, thoroughly versatile, yet inexpensive and simple to use.



05

06

WE GOT FURTHER WITH *WORLD BUILDER* IN ONE AFTERNOON THAN IN A MONTH WITH *WORLD CONSTRUCTION SET*

[03] Not only does *WB* do water, but it does waves and white water. You can even float objects downstream!

[04] Volumetric lighting and haze, high-quality grass and excellent water enable the program to produce images like this.

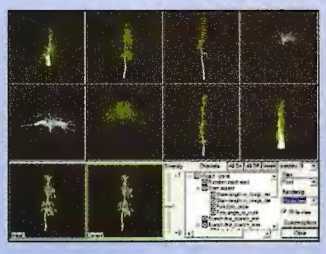
[05] Here we've created two overlapping areas (cyan lines). One defines a grassy plain and the other contains a forest. This simplicity is one of the program's greatest strengths.

[06] You don't need to spend hours grinding away at manuals. The program's animated tutorial gets you up and running in no time.

VARIETY IS THE SPICE...

World Builder includes a fantastic new tool called the Variator, which can rapidly produce multitudinous variations of an object, particularly a plant or skyscape. It uses an integrated scripting language that you can modify if you have the expertise, but even its default settings produce superb results.

With plants, it uses a simple formula that generates eight mutated versions of your source plant, with different-sized leaves, bendier or straighter stems, bushier or leaner foliage and so on. Any of these variants can then be used as the source for further mutation, until you reach the desired look, at which time you can add the new plant to your library. It's a brilliant way to create unique objects for your landscapes.



This is the Variator at work generating new plants from a single original.

3Dworld Verdict

PROS

•Easy to use •Highly versatile •Quick to add complex features

CONS

•Lacks the technical precision and realism of *WCS* •No way of adding roads except as models •Poor OEM handling

The Animator's Survival Kit

The legendary Richard Williams is in print with animation techniques and anecdotes BY MARK BRIERLEY

WRITER
Richard Williams

PRICE Paperback £20
Cased clothbound £30

PUBLISHED BY
Faber and Faber

SIZE 342 pages, 28x24cm (hxw)

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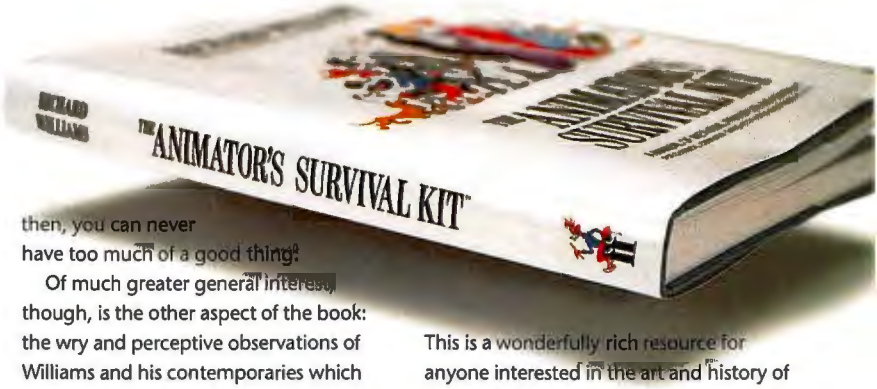
Richard Williams: a name in the pantheon alongside such luminaries as George Pal, Nick Park, Max Fleischer, John Lasseter and Tex Avery; winner of over 250 animation awards (including three Oscars); the inspirational dynamo behind numerous classic animated sequences from *Pink Panther* to *Roger Rabbit*; the master of the perennially popular Animation Masterclass. His new book offers itself as a tour-guide around the often bewildering world of classical character animation.

Large, lavish and hefty, this text is actually two books inside one jacket. First, we have an utterly comprehensive (and reasonably comprehensible) manual of animation technique, liberally illustrated with drawings and diagrams positively fizzing with vitality, and interleaved with text explaining and expanding on everything from bouncing balls to exotic dancing (perhaps not that great a leap, come to think of it). Each section (Walks, Weight, Dialogue, and so on) carefully leads the reader through time-honoured procedures, and offers analyses of common animation problems and their solutions, all with the emphasis on ensuring that every permutation and subtlety is fully explored. To a certain extent, this treads the same path as other books in the same vein (Preston Blair's *How to Animate Film Cartoons* and *Timing for Animators* by Whittaker and Halas) but then, you can never have too much of a good thing.



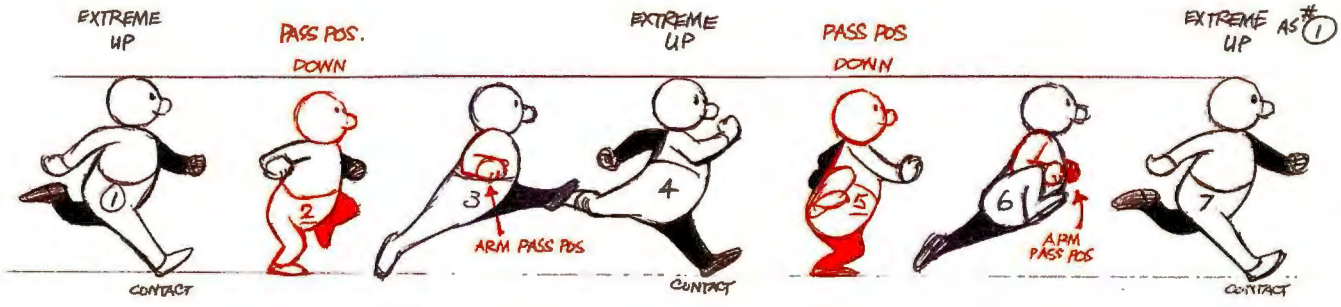
> LARGE, LAVISH AND HEFTY THIS TEXT IS ACTUALLY TWO BOOKS INSIDE ONE JACKET

Of much greater general interest though, is the other aspect of the book: the wry and perceptive observations of Williams and his contemporaries which permeate the volume. Bons mots, animation tips, cartoons and asides combine to create an atmosphere of excitement and enthusiasm which is quite contagious, and are drawn from his vast treasure-trove of professional experience and personal reminiscences. Hugely entertaining are the range of photographs of Williams as an eager beaver standing on the shoulders of giants (all debts fully acknowledged) and the peek inside his sketchbooks and life-drawing portfolio, revealing a superb draughtsmanship and a full understanding of what constitutes the human form. There are a variety of invaluable comments and insights straight from the horse's mouth, where the authors' innate good humour jumps off the page and cannot help but engage even the most jaded and cynical computer animator.

This is a wonderfully rich resource for anyone interested in the art and history of animation, but a couple of minor cavils do surface. Rich it may be, but unfortunately 'rich' can equate to 'indigestible' at times: the information packs itself ever tighter onto each successive page (particularly noticeable in the hundred or so pages devoted to walks and runs), and although the cover boldly suggests the book is not only for traditional animators but for "computer, games... and Internet" animators as well, it is primarily a celebration of 2D drawn animation and will require a certain degree of sifting by the digitally inclined.

Nevertheless, this book is much more than the sum of its parts. Buy it as a work of art in its own right, as an insight into one of the guiding lights of the industry, and as an investment in your own future as a great character animator.

3Dworld Verdict



BELOW The walks and runs section of the book are extremely detailed and could prove a little overwhelming for beginners.

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- Alpha texture blending
- ActiveX viewer

You want a lofty dream? Try this one on for size. Imagine a 3D multimedia tool that lets you create real-time animated presentations. Not the pre-rendered walkthroughs that you might expect from *3ds max*, but fully interactive presentations. Now imagine that allied to an ultra-rapid development system where you drag and drop ready-made components and connect them to define every aspect of the presentation without writing a single line of code. And imagine a system so flexible that it can produce stand-alone animations, visualisations, screensavers, Winamp plug-ins, Websites and even games. It's a lot to ask, but *Quest3D* has the brass neck to promise not just that it will be possible but that it will be *easy*.

Quest3D has no facility for creating object meshes or textures itself – you'll need a separate modelling and painting application to do that. What it will do is take static images, sounds and models and turn them into an animated interactive production. The developer, Act3D, has been doing this for Shell, CMG and Nvidia for the last three years. Originally its technology was a trade secret but it has finally wised up to the possibilities of turning it into a product in its own right. Rather than release a library of C++ functions however, Act3D borrowed from the world of visual programming and bolted on a rather intriguing drag-and-drop interface.

It works like this: everything in *Quest3D* is a 'channel'. A channel can store data or perform an action or both. A sound sample would be one channel, a texture would be another and a command to rotate an object might be a third. Channels are picked from a palette and dragged onto the screen, where they are represented by a small grey box. Each channel has little lugs protruding from the sides to indicate that it can be connected to other channels. Input is received from the connections along the bottom edge and output is supplied to the connections along the top. To connect two channels you simply drag a line from the bottom of one to the top of another, but the connection will be made only if the channels are of the right type to supply valid data to one another.

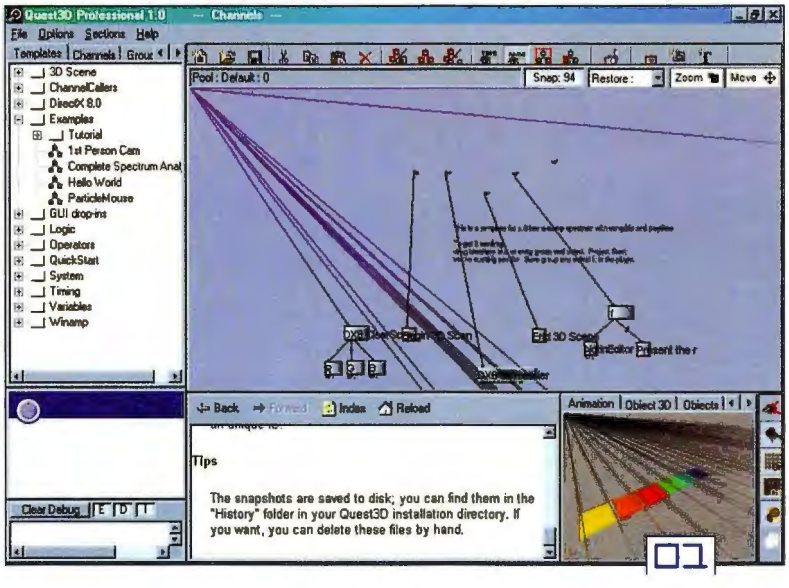
In effect, these channels are simply functions and procedures and the connections represent function calls and parameter-passing between them. Hardened programmers may find the system confusing at first, but it does have the advantage of allowing a complex project to be structured in two dimensions rather than a simple linear flow of program code.

The Channel Graph view is only one of three different ways of editing a project.

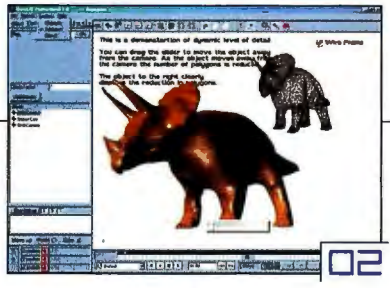
> THE RADICAL CHANNEL-CENTRED INTERFACE WILL POLARISE OPINION INTO LOVERS AND HATERS, BUT A PROJECT CAN BECOME A WEBSITE IN MINUTES

There are also the Object and Animation views, which are used to set lighting and textures and to control the way elements in the project move. As well as the main editing window and the toolbar, the *Quest3D* desktop normally displays several other panes including a preview of the project itself. This is rendered in real-time and loops continuously by default. Every change you make to the project is immediately reflected in the preview window – there's no need to click any redraw button.

There is no doubt that *Quest3D*'s modular interface encapsulates some very powerful development tools in a way that would otherwise be daunting to non-programmers, but the system is not without its flaws. The channels are often simply wrappers for DirectX functions, and the huge number of them that are required for a project of any worthwhile size can quickly turn the channel-graph view into a spidery mess. This is not helped by several drawing glitches that can cause channel connections to snap to the screen margins when scrolling or zooming the graph. Channels can be combined into groups to collapse the view, which helps somewhat but introduces problems of its



[□□] Drawing glitches like these can make it hard to see what's happening on the channel graph. The lines jump about when your model animates too.



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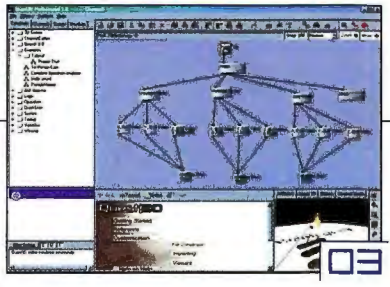

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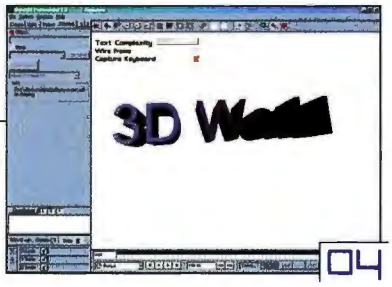

04

[02] *Quest3D* supports dynamic LOD in order to reduce the polygon counts in objects that are too far away for it to matter.

[03] As your animation runs, you can see the value of each of the parameters continuously updating in the channel graph.

[04] You can capture keyboard input in real time as well as joystick and mouse positions, and the system fully supports scroll wheels and throttle controls.

own when you try to link channels in different groups.

The manual is also one step short of entirely hopeless, being written in rather strange English (Act3D is a Dutch outfit) and driven totally from a programmer's perspective. Just 15 of the 300 pages are given to explaining the arcane rules that govern how channels may be placed and connected – most of the rest is simply a reference list of the available channels.

Once your project is complete, you can choose how to distribute it. There are four *Quest3D* viewers currently available: a standalone executable for running games and presentations, a WinAmp plugin, a screensaver and an ActiveX control. This last viewer is perhaps the most exciting because it allows *Quest3D* projects to be embedded in *PowerPoint* presentations, *Excel* spreadsheets, *Visual Basic* applications and, of course, Web pages. *Quest3D* has been designed with internet distribution in mind from the ground up and projects can be set to dynamically download channels as they are needed.

05

[05] This image was created with light sources imported from *LightWave* and then modified from within *Quest3D*. Image by LetsLook (www.letslook.com)

This, coupled with the fast render times and interactive elements of *Quest3D* make it a very strong option for Web 3D.

Inevitably, the radical nature of *Quest3D*'s channel-centred interface will polarise opinion into lovers and haters. Although it saves you some of the burden of learning the correct syntax, essentially this is still programming and it requires a good understanding of the DirectX API to use well. Nevertheless, by removing the need to compile source code, *Quest3D* can immediately show you the result of each change or addition, and this makes for a much more organic way of working. Projects can be rapidly customised, almost while the client is looking over your shoulder, and changing the finished project from a standalone presentation to a Website takes minutes, not days.

KEEP LOW-END VIEWERS IN MIND

BECAUSE QUEST3D projects are rendered in real-time on the end-user's own machine, the rendering algorithm must be able to cope with a wide variation in 3D horsepower without dropping the frame rate too much. Inevitably, this results in restrictions at the design stage. You can see an example of this in the way lighting is handled. Add more than eight lights to your scene and you'll find that not all 3D accelerators can display it correctly. Worse, the lighting algorithm for spotlights is not very accurate and can produce some unexpected effects. *Quest3D* advises you to stick to point lights or use spotlights with an inner cone angle of 0 to minimise this.

Rendering is done at the client end, so performance varies

3D world Verdict

PROS

• No scripting language to learn • Powerful animation • Flexible range of viewing modes

CONS

• No OpenGL support • The manual is patchy and semi-literate • No 3D model builder • Practical limits on the way lighting is handled

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Can 3Dlabs' latest high-end graphics card live up to its price tag? BY SIMON DANAHER

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- On-chip OpenGL
- Volumetric texture support
- Stereo viewer output

Graphics cards. The hardware geek's second favourite bit of kit after the CPU. With the amount of jargon and techno-babble spoken by card and chipset manufacturers, it's no wonder these pieces of hardware have gained a certain mystique.

A 3D graphics card needs to do one thing well, and that's make your 3D display go faster. There are other considerations of course, like the ability to drive multiple monitors or digital displays, but making 3D faster is a 3D accelerator's raison d'etre. The Wildcat II 5000 from 3Dlabs is a high-end offering designed to do just that, how well it succeeds against other less-expensive cards we shall see in moment, but on unpacking the card you are certainly filled with anticipation. It's a huge product packed with silicon and heatsinks and looks every bit what you'd expect from a high-end offering. The Wildcat II 5000 is special though because it's the first Wildcat card that you can actually go out and purchase without a workstation attached to it. Previously, its big brother the Wildcat II 5110 was only available as part of a system. The little Wildcat we have here is really half a WildCat II 5110, since it features a single-channel

architecture as opposed to the 5110's dual-channel construction. The 5110 is a beast so we were expecting great things of the 5000 too.

Fitting the AGP card is not straightforward because it's a full-length unit which needs to be held firmly in the workstation chassis at its tail end for proper security. The cooling system with its rear-mounted perpendicular fan also means that the card nullifies the adjacent PCI slot. The card has a double blanking plate to prevent you from attempting to squeeze in a PCI card next to it.

> IN USE THE CARD PERFORMED WELL BUT NOT AS WELL AS ITS PRICE TAG AND APPEARANCE SUGGEST

It seems far fetched that 3Dlabs could not find a lower-profile solution to the cooling problem. You certainly appear to get a lot of card for your money. Maybe that was the real reason for its girth.

In use, the card performed well though not as well as its price tag and appearance suggest. The drivers were very well written however and worked pretty much flawlessly with all the apps we tested the card with. For sheer price/performance you'd be better off looking elsewhere, most likely at an NVIDIA-based card, but the Wildcat does offer a large 80MB of texture memory, digital (DVI) and VGA output as well as stereo viewing support plus compatibility with a large number of 3D and CAD applications.

There are other niceties like support for 3D volumetric textures (useful for medical visualisation and the like) and a full on-chip OpenGL implementation. The bottom line though is that in raw poly-pushing tests, the card's performance can be equalled, or even bettered, by products costing a lot less. At around £1000, you would really expect to be getting a lot more power than this card actually has to offer.

PICTURES COURTESY OF © Calvin Roberts

3Dworld Verdict

PROS
• Fast OpenGL performance • Qualified with countless 3D apps • Good, solid drivers

CONS
• Very expensive • Very large AGP card that swamps the adjacent PCI slot • Performance is not as hot as the price tag suggests

3D world

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WHAT DO YOU DO, THEN?

ADRIAN BANNINGA
Visuals/FX, Streamline Studios

My biggest thrill comes from waking up in the morning and going in to work. This might sound strange to most people, but I love my job. We started Streamline Studios hoping that we could get enough jobs to survive and never have to do the '9 to 5, slave away at a job you hate' thing. I can cheerfully report that it's been more than an eight-hour passion, and I have no complaints.

A lot of the time in this industry people tout accomplishments left and right. I don't feel the need to do that, because a win for one of our peers is a win for the industry as a whole. The European 3D scene isn't so new, but it faces a lot of challenges in order to compete with its fellow brethren in the United States. A trend I've noticed is the lack of support when it comes to promoting the 3D industry as a viable career for the youth of today. How will the industry ever be able to climb higher when it can't recruit, find, or train, a new talent pool?

Streamline Studios is based in Holland, and I see it first hand every time we're looking for home-grown talent. The continental attitude that 3D art is for hobbies has to change. The only way it can is if studios get involved within their local community. There are a lot of talented people out there that are self-taught who only need that push or mentorship that would open the doors to this industry.

I'd love to say that everyone has the resolve to venture out on their own, pick up a 3D package and teach themselves the basics, but I'd be delusional. Unfortunately, the desire for creation doesn't always override the perceived social common sense.

The solution to this is building a visible community and social networks that promote the education, training, and employment necessary to sustain the industry. As Streamline Studios continues to grow, we plan on making it a corner-stone priority for our business and we hope that others do the same.

CONTACT: www.streamline-studios.com

MOVERS

GLASSWORKS, the Soho-based 3D animation and digital effects specialist, has promoted two key staff as part of a strategic restructuring. **SALLY MATTINSON**, a member of the company since 1996, has been promoted to Head of Production while **LOUISA THOMSON** has been promoted to the post of General Manager.

EX-REFINERY/ALDIS ANIMATION members **PHILIP DOBREE** and **WILLIAM ROCKALL** have founded a new production and post-production company, **JELLYFISH PICTURES**, with competitive rates for 3D animation and compositing already attracting new broadcast and film projects for the London-based start-up.

MOVING PICTURE COMPANY has added two additional 3D animators to its ranks. **SIMON CLUTTERBUCK**, formerly of **SMOKE & MIRRORS**, and **MARTIN CARROLL**, previously of **FRAMESTORE**, will both be working on film and longform broadcast projects.

According to reports, **DISNEY** is to close its VFX facility, the **SECRET LAB**, after **REIGN OF FIRE** and **DOWN AND UNDER** are completed. **DREAMQUEST IMAGES**, which became the **SECRET LAB** in 1999, was founded by **HOYT YEATMAN**, who will oversee external effects contractors for future films.


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EDITOR'S STATEMENT

3D World is the international magazine for all 3D artists, so whether you are at the top of your game, working for a world-famous CG house, or a student just finishing your course, *3D World* will have something for you. With articles by industry leaders, tutorials by experts and all the news that's going on in the 3D industry, *3D World* is a vital read.

Ed Ricketts
3D WORLD EDITOR

VIEWS TWO

There's an extra edition of Views this issue – see page 26 for more. If you would like to express an opinion or raise an industry issue, simply send an e-mail to **3dw.views@futurenet.co.uk**

SUBJECT: FINAL FANTASY: THE STORY CONTINUES...

I was surprised when I read some of your words in a recent issue. What surprised me was that anyone who has seen both movies could be in the least puzzled by the difference in the success of *Shrek* and *Final Fantasy*.

I thought *Final Fantasy* was the most cliché-ridden, dull and unoriginal film I have seen in years, with dialogue mostly as scintillating as a brick manufacturer's catalogue. What movie-makers must realise, whether their film is 100 per cent computer graphics or if not a single frame has been near a computer, is that the talented storyteller wins every time. People want to see something that moves them, and even if the small number of us who make 3D images are wowed by the graphics in a movie because we know how hard it is to make them, the majority don't give a damn how it was made.

If movie-makers want to judge a script they need do one thing: get a sample audience in a room with a sound system and comfortable seats, then assemble a cast of actors in another room with microphones to read the script. If the script is a very visual one then use a narrator and a projector with a storyboard sequence, though visuals should be avoided if at all possible. On no account should any moving images be shown at this stage. After this ask the sample audience whether or not you should bother making the film, because if a script reading isn't enough to entertain then the script simply isn't good enough.

Those who want success at the box office could do no better than try my suggestion with every script they consider, and be absolutely rigid about rejecting scripts that don't entertain just from a reading. Some who have enjoyed *Star Wars* still go out and buy *Doctor Who* on videotape and DVD. While most of these people would probably admit that the special effects in those *Doctor Who* videos are absolute pants compared to *Star Wars*, they find the stories entertaining.

Just to avoid disheartening those who long to create a visual spectacle, I also believe that good visuals can enhance the movie experience enormously. Though the main reason for the success of *Terminator 2* was the traditional suspense of a good pursuit tale, the shapeshifting robot certainly provided some novel and unforgettable moments; yet these sequences were firmly in place as supports to a story, not substitutes for one.

PICTURE COURTESY OF: © Pixar

In addition there will always be exceptional works like the legendary *Luxo Jr* which gains much effect from the inspired use of movement and sound effects and which could arguably be described as a work of genius. Even *Luxo Jr*, though, tells a nice little story which invokes feelings many of us have felt or witnessed in the relationship between parents and playful offspring. The lesson is obvious, so for goodness' sake movie makers of all kinds, learn it before it bites you hard in the bank balance.

I just had to get that off my guts, thanks for a good magazine and keep up the good work.

Mark Knight, e-mail

...AND CONTINUES

I feel that *Final Fantasy: The Spirits Within* was technically a milestone in computer-generated imagery on film. Notice I didn't say computer animation – I'll explain later. It looked pretty fantastic, especially the characters, and I am sure that Alias|Wavefront was absolutely delighted with the new source material for its showreels. However I do also feel that *Final Fantasy* was not ground breaking enough.

A month or so before the film came out I was browsing through the Softimage site and stumbled upon its gallery. In it I saw an image that blew me away. The image was of a old man rendered beautifully by Ulf Lundgren in *Softimage|XSI*. It was so photorealistic that I doubted it was CG at all.

That was the problem for Square. When it started making *Final Fantasy* it was ahead of the game. It was creating characters and locations like we had never seen before in pure CG. However that was four years ago and time moves on as well as software. By the time we arrive in 2001, single end users are able to get the same results at home without a large team of modellers and textures. Although Square obviously updated its software and models with time, it was not keeping up with the rest of the world. One of *Final Fantasy's* own animators said as much in an interview recently. The problem is changing everything you have previously done up to that point. On a feature like *Final Fantasy* it would have taken thousands of hours just to update everything; so instead Square updated the bare minimum to make it look better.

But I think *Final Fantasy's* biggest failing was the attempt to be photorealistic anyway. The general public are not computer animators or artists, most of them don't have any concept of how much work goes into producing these films. So when you sell your CG project as photorealistic, they are going to expect that. I personally went to see the film with a friend who has nothing to

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do with 3D imagery. They said that they were not convinced at all by the characters, claiming that Woody or Buzz Lightyear were more real to them. I have heard others agree with this comment.

This is the sad truth. If you can animate a character in such a way that you can convince an audience that it is alive within the realms of its environment, then what it looks like really doesn't matter. I have even seen paper clips with personality, as well as other inanimate objects. The plight *Final Fantasy* had was that most (not all) of the animation was taken straight from motion capture, which doesn't accentuate the animation as needed for the audience to believe they are real. Woody and Buzz were both animated by hand and the animation was exaggerated, which strangely made them more believable than the characters in *Final Fantasy*.

Finally, the story for *Final Fantasy* was a bit specialised. To be honest I didn't mind it all that much, but then I have seen a lot of Manga films. If you want it to do well in the cinema then you need to be a bit more middle of the road.

The future of fully CG films? Well thankfully *Shrek* did well this year and hopefully so will *Monsters, Inc.* I imagine both Pixar and PDI were watching closely when *Final Fantasy* hit the screens, but both are probably sighing with relief now. Pixar and PDI will probably go on making fully CG films for a long time now as their successes have been fruitful. As for photorealistic CG features, I think a little re-thinking is in order. A good story will translate well whatever the medium, so you could start there.
Sam Clark, Polaris Digital, via e-mail

SUBJECT: ANTI-GRIPING

I noticed a bit of griping in the October issue of *3D World*'s Views section, and I felt compelled to write your magazine to tell you I think you're doing a fantastic bit of work.

The 3D industry is an awfully broad market to try to cover. How does an editor justify writing tutorials for *Bryce*, for example, when a large portion of its readership swears allegiance to *LightWave*? How do you grapple with a tutorial on constructing a woolly mammoth, when *max* and *Maya* might require such different approaches? We all identify ourselves as 3D artists, but when it comes down to it, the application you use has great influence on your approach, despite the fact that the basics may be the same.

One thing I really admire, and which helps counter the fractured nature of our craft, is the Exhibition pages. Never have I seen a better series of high-resolution colour 3D renderings, from such a wide variety of artists and applications. I have to also give a nod to the kind of approach Bill Fleming used in his 'Jurassic Carp' tutorial. Although the fish is clearly being constructed in *LightWave*, I can see he's used more generic terms to make the tutorial more accessible to users of other packages. I haven't seen any other publication on the market work as hard to be this comprehensive.

A point I will agree with one of your readers, however, is your review system. As things stand now, you may as well change the Reviews section to 3D World Recommends... and dispense with the ratings system altogether. Almost everything reviewed is given four and a half marks which, in essence, makes the process of reviewing rather pointless.

One problem may stem from straightforward user bias. Your review of *trueSpace 5*, for example, was written by Robert Mitchell, while the review of *Animation Master* was submitted by William Eggington. Both are terrific artists in their own right, and both did point out some of the drawbacks of their respective package of choice, but I can't help but feel their reviews were coloured by their years of loyalty to their chosen software.

That aside, the reviews have been universally as well written as the rest of your content, and still make for interesting reading. I've taken a peek at nearly every 3D magazine ever offered, and so far, *3D World* is the only one that I feel has found true success. Keep it up!
Edward W. Swan, via e-mail

PICTURE COURTESY OF: © Ulf Lundgren

LEFT Pixar's *Luxo Jr* – a classic example of telling a story with even the simplest of technology and characters.

ABOVE Ulf Lundgren (of Filmtecknarna) modelled this photorealistic head of an old man as a personal project.

BELOW *3D World* is changing (slightly), so let us know what you what to see!

Well, glad you like the magazine. We often wish we had 200 pages a month so we could fit in everything we want and please everyone at once, but unfortunately it's just not possible (at the moment). As you say, though, we do generally try to make tutorials non-software-specific, unless we're demonstrating a particular feature.
Taking your other points in order:

1. Reviews: I completely agree. In my opinion this is a common occurrence with magazines – at regular points the benchmark average for reviews has to be 'reset' to take into account the overall improvement in hardware and software. For instance, when 3D World *was first launched, there was nothing of the standard of* XSI 2 *or* Maya 4 *available. We'll be making a few general changes to the magazine over the coming months and this will be one of them.*
2. User bias – this is a tricky one. It obviously makes sense to give a new version to someone who's already very familiar with the product. And, surprisingly, these are often a package's biggest critics, simply because *they're used to all its little idiosyncrasies. Diehard users don't take kindly to what they regard as useless bells and whistles in upgrades, or strange alterations to their beloved system. But on the other hand, as you say, unless a manufacturer really messes up a release, it's always going to get a reasonably good mark. Again, this will be addressed in our gentle shake-up of the magazine.*

I should add again that we really value intelligent feedback such as this. I'm always happy to hear what you like, what you don't and what else we could be doing to bring you the best 3D magazine possible – send your ideas to us via Views, by e-mail or on our forum at ***www.3dworldmag.com.***

cd interactive

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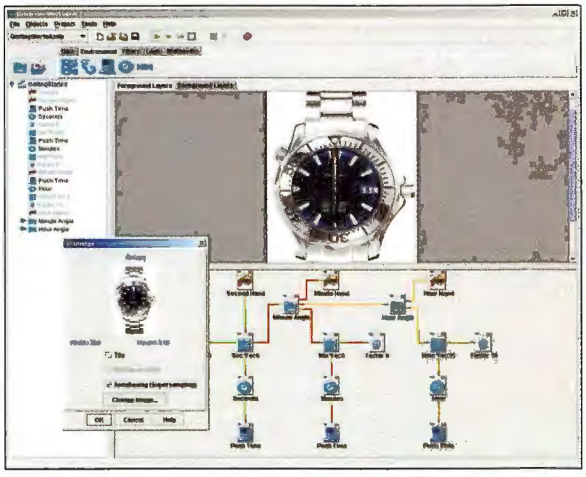

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CONTACT: www.demicron.com

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Upgrade to *WireFusion 2.1* and save 50%. *WireFusion* is a drag-and-drop visual-programming tool for creating plug-in-free interactive 2D and 3D presentations without having to learn any Java or scripting language.

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Here are some highlights of what you can do in *WireFusion 2.1*:

- **Real-time 3D**
- **Combine real-time 2D and 3D in a presentation**
- **Animation and interactivity on 3D textures**
- **Advanced logic without programming or scripting skills**
- **Presentations without plug-ins**
- **Reuse code, keep files compact**
- **And independent Java developers can produce new *WireFusion* objects with the included PluginMaker**

WHAT IF YOU NEED FURTHER ASSISTANCE WITH THE CD?

Before contacting us, please be sure to read the entry relating to the software you're trying to use. If you have a problem getting a program to run, contact our technical-support department using one of the following methods.

- e-mail 3dworld.support@futurenet.co.uk
- Web www.futurenet.co.uk/support
- fax +44 (0)1225 732279
- telephone +44 (0)1225 442244 (ext 2101)

At **www.futurenet.co.uk/support** you will find a list of frequently asked questions and solutions to common running problems reported for our coverdisc. This website is kept up-to-date and has links for downloading any material that might solve a potential problem.

Please e-mail our support team at the dedicated *3D World* e-mail address quoted before trying to telephone. The lines can be very busy at times. We regret that due to the complexity of the software on our CD we are unable to offer full support beyond installation queries.

WHAT IF I HAVE A FAULTY CD?

This is highly unusual, but if it's confirmed by our technical-support team please return your faulty disc to the following address and a free replacement will be with you within 28 days: Bluecrest International Ltd, Unit 6, Avenue 1, Station Lane Industrial Estate, Witney, OX8 6XZ, England.

Demo PC, Mac and Linux

MojoWorld Transporter 1.02

Landscape generation the fractal way

Most 3D landscape software relies on polygons to create scenery, but *MojoWorld* is different. It generates super-high-quality worlds using fractal mathematics. This means that whether you view the landscape from orbit around the planet or at six inches above the ground, you get the same level of detail.

CONTACT: www.pandromeda.com

Demo PC only

WorldBuilder 3.0

Produce realistic sky, water and landscapes

Generate realistic 3D landscapes. Multi-layer your skies, edit planet radius, animate suns, use volumetric light. Water can have wave options, colour variation for depth, auto-reflect and refract, waterfalls. See review on page 76. (Demo lacks save, export, resolution over 400x300.)

Minimum system: PII 300MHz, Windows 98 or NT2000, 128MB RAM, 40MB on disk

CONTACT: www.digi-element.com

Demo Dual Format

Electric Image Universe 3.1

Feature-packed modelling and animation

Electric Image Universe, like *LightWave*, is a dual application. Its modeller, with an intuitive interface, has solids, NURBS, subdivision surfaces and is independent of resolution. The animator has enhanced IK, function curve editor and fast deformations. Also: fast photoreal 3D renderer, antialiasing, raytracing with channels, reflection-map occlusion options. (Demo lacks save, export)

Minimum PC : P3 266, Windows 2000 or NT 4.0.6a, 128 MB RAM, 32MB OpenGL display card, 1024x768, QuickTime 4.03
Mac: PowerPC, MacOS 9.0, 40MB application RAM, 96MB on hard drive for Modeler, 30MB for Animator, CarbonLib 1.1.1

CONTACT: www.electricimage.com

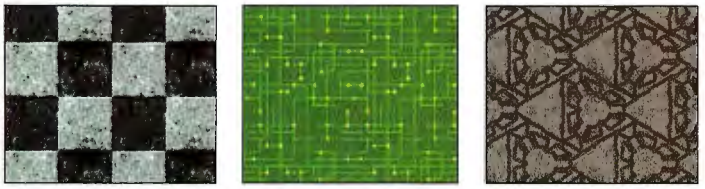
Textures and Demo PC only

Infinity Textures

A surfeit of 112 seamless surfaces

These 112 seamless textures in JPEG format were made with *Infinity Textures 2*. The shareware version of this application is also included on this disc: you can create your very own texture libraries. For private (non commercial) use only.

CONTACT: www.i-tex.de



Textures

Urban Jungle: Inner City Textures

Another 50 high-res photographic textures

This is the second collection of 50 textures from the *Urban Jungle: Inner City* textures collection. Again covering a variety of urban and industrial topics, this set features graffiti, doors and windows along with plenty of other goodies.

CONTACT: www.cancerian.htmlplanet.com

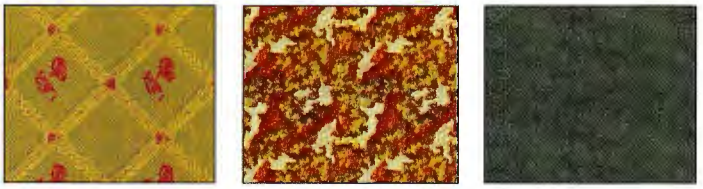
Textures

T3: Toob's Tiled Textures

50 more of those 3D textures from Toob

Here are another 50 rendered textures from Toob, who first appeared way back on the CD of issue 8. This month's collection contains a wide variety of textures covering organic, fabric, synthetics plus many other categories.

CONTACT: www.textureartist.net



EXHIBITIONIST

This issue's up-and-coming 3D artist in our exhibitionist section is Peter Aversten.
CONTACT: aversten@meshmen.com

EXHIBITION

A further collection of work from artists around the globe. Send your pics and you may appear next issue.
CONTACT: 3dw.exhibition@futurenet.co.uk

TUTORIALS

As well as full-size screenshots and supporting files for all of our tutorials we have another selection of dvGarage tutorial movies.

MOVIES

***3D World* brings movies from:**

- **Fathom Studios**
- **BBC MediaArc**
- **Treehouse Pictures *(Little Red Plane)***
- **ART**

perspective

3D goes to war

They can't show video of what the military is doing in a far corner of the world, so the networks spice up the news with 3D graphics. **BY STEVE COOPER**

As for the news, what can one say that hasn't already been said? Like most of the connected world, I watched events in New York and Washington DC unfold and evolve day by day. Glued to the big cable news channels, memories were burned with amateur and professional video clips. In less than a month, military involvement became a reality and the broadcast content changed as national security interests stepped in, wisely limiting what images were shared with the viewing public.

In the absence of riveting video material of air and field operations, news stories were spiced up with an unlikely on-screen resource. 3D graphics were called in from the Web, and video cameras focused on the windows of interactive players. Newsreaders provided voice-over as production teams rotated 3D models of aircraft, missiles, maps and real-time animations. Rich media content had become the focus of the event, providing the only glimpse of military systems used in a distant corner of the world.

While watching the video broadcast of these 3D Web graphics, it struck me that in lieu of what could have been compromising video footage, a safe and yet informative method has been discovered for graphically depicting the subtle intricacies of complex hardware. Using existing 3D models, a few bits of copy, a player and a mouse, the networks delivered a tour of the story. These features dovetailed into the flow of the broadcast, and on each occasion were improvisational. A variety of models rotated clockwise one time, counterclockwise another, allowing a detail to be the focus at the top of the hour and quickly overviewed at a quarter past.

Re-broadcasting rich media 3D Web graphics to news-hungry audiences was a brilliant choice. Output a monitor display to a video input, and the Web becomes an interactive information source. By design, most 3D players for the Web and their content are ideal for this purpose. They're easy to use, fast, colourful, and can be used without language barriers at any time, over and over again. What's more, they're easy to set up with a few pieces of 3D content and a few commercially available tools.

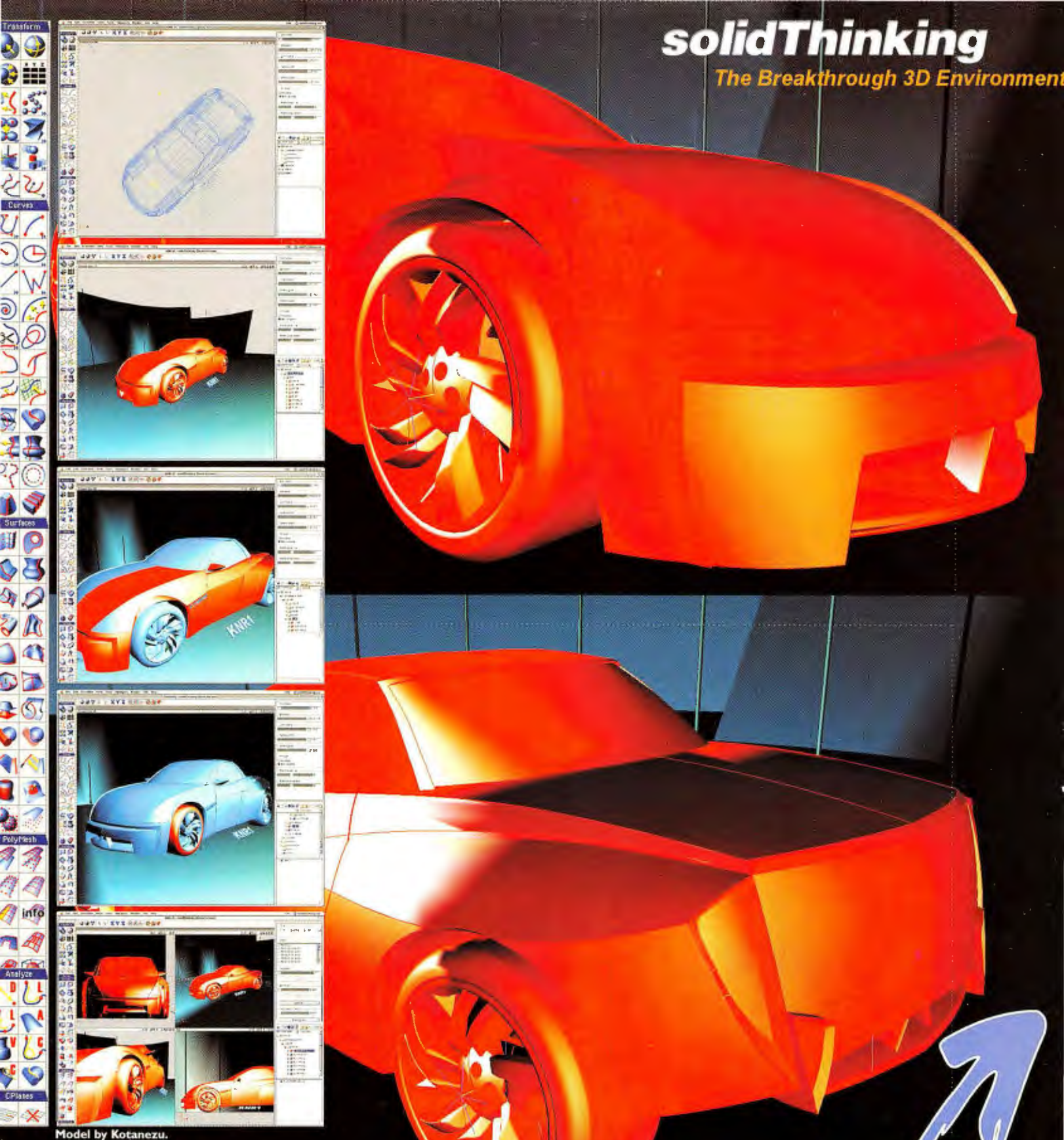
WEB 3D PLAYERS ARE IDEAL: EASY TO USE, FAST, COLOURFUL, NO LANGUAGE BARRIER

Re-purposing content has become standard fare, as images, video, copy and databases have been ported to the Web. However, it now seems that rich media content is heading in a new direction. Topical news stories will rise and fall, but when it comes to documenting these events there will always be the need for an informative way to show the unseen details.

The needs for interactive 3D graphics are extensive. Satellites in orbit, deep-sea rescues, internal medical procedures, chemical processes and high-speed mechanical actions are all examples of obscured events that play a role in our world. Designing 3D graphics to illustrate each of these is well within the scope of what is possible, and in many cases has already been done. Perhaps as technical stories like these find themselves in the limelight, they too will have their rich media 3D content broadcast to the world over cable, satellite and network television.

It's all about the story. And the distinctions between the ways of delivering that information have blurred.

STEVE COOPER is the president of Curious Labs, Santa Cruz, California. Visit his Web site at www.curiouslabs.com



Model by Kotanezu.

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